IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 8, August 2026

DOI: 10.17148/IARJSET.2026.13820

Women Safety System Using AI Techniques

Mr. Santhosh Kumar T R [1], Kavana N[2], Kavana V M [3], M Kavana [4], Namratha S[5]

Assistant Professor, Information Science and Engineering,

Don Bosco Institute of Technology, VTU[1]

Undergraduate Student, Information Science and Engineering,

Don Bosco Institute of Technology, VTU [2,3,4,5]

Abstract: Women's safety has become a significant social concern due to the increasing number of crimes and emergency situations affecting women in public and private environments. Recent advancements in Artificial Intelligence (AI), the Internet of Things (IoT), Edge AI, wearable devices, and mobile computing have enabled the development of intelligent safety systems capable of providing rapid detection, monitoring, and emergency assistance. This survey presents a comprehensive review of thirteen recent research works that focus on AI-driven women safety technologies, including smart wearable devices, audio-based distress detection, sound anomaly recognition, offline emergency response frameworks, intelligent mobile applications, secure communication systems, health monitoring devices, safe route navigation, and Edge AI-based surveillance systems.This survey analyzes the objectives, methodologies, system architectures, advantages, and limitations of the selected studies and provides a comparative understanding of current AI-based women safety solutions. The analysis identifies existing research gaps, including challenges related to detection accuracy, scalability, false alarm reduction, privacy protection, and integration of multiple safety features into a unified platform. The survey highlights recent technological advancements and offers valuable insights into the development of intelligent, reliable, and user-centric women safety systems using Artificial Intelligence.

Keywords: Women Safety, Artificial Intelligence (AI), Internet of Things (IoT), Edge AI, Smart Wearable Devices, Audio Recognition, Sound Anomaly Detection, Distress Detection, Emergency Response System, GPS Tracking, Health Monitoring, Safe Route Navigation, Machine Learning.

I. INTRODUCTION

Women's safety has become one of the most critical social concerns worldwide due to the increasing number of crimes, harassment, assault, domestic violence, and other emergency situations. Despite the rapid advancement of communication technologies and public safety initiatives, women continue to face security challenges in both urban and rural environments. Traditional safety measures, such as manual emergency calls and conventional security applications, often depend on user intervention and may not provide timely assistance during critical situations. Consequently, there is a growing need for intelligent and automated safety systems capable of detecting emergencies and providing immediate support. Recent developments in Artificial Intelligence (AI), the Internet of Things (IoT), Edge AI, wearable technology, and mobile computing have significantly transformed the design of women safety systems. AI-based solutions can analyze audio signals, recognize distress patterns, monitor health parameters, identify abnormal activities, and automatically generate emergency alerts. Similarly, IoT-enabled devices integrate multiple sensors, GPS modules, communication technologies, and cloud services to provide real-time location tracking and rapid notification to emergency contacts. Edge AI further enhances these systems by enabling faster decision-making, reducing communication delays, preserving user privacy, and ensuring continuous operation even under limited network connectivity.

Several research studies have proposed innovative approaches to improve women's safety through intelligent technologies. These include smart wearable devices capable of monitoring vital signs and detecting emergencies, mobile applications with panic detection and audio recognition, sound anomaly detection systems for identifying screams or distress signals, AI-powered offline emergency response frameworks, secure communication devices, health monitoring systems, intelligent surveillance platforms, and safe route navigation applications. The integration of machine learning, deep learning, speech processing, sensor fusion, and real-time communication has improved the effectiveness of these solutions by enabling automatic emergency detection and faster response mechanism

II. LITERATURE REVIEW

V. Hariprasad, K. Kirubasankar, R. Rajesh Kanna — *Next-Gen Smart Wearable Device for Women and Children's Safety Using Edge AI*: The paper presents a smart wearable using Edge AI for women and children safety. It monitors surroundings, health conditions and location using sensors and GPS. Emergency alerts are sent to registered contacts

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 8, August 2026

DOI: 10.17148/IARJSET.2026.13820

during danger. Battery life, hardware cost and detection accuracy are major concerns. Pragya Sharma, T. Jemima Jebaseeli — *Smart Scream and Panic Detection System for Women Using AI*: The research focuses on detecting screams and panic sounds using AI. Machine learning classifies distress sounds from normal environmental sounds. Detected emergencies trigger alerts and location sharing with contacts. Noisy environments can cause false alarms and reduce accuracy. K. V. Priyadharshini, M. Nitharshana, S. Prasika, S. Prithiba, M. Sowmiya — *Women's Safety App Based on Artificial Intelligence: Sound Anomaly Detection*: The paper presents an AI-based mobile app for detecting abnormal sounds. Audio processing and machine learning identify dangerous situations. The system sends alerts and GPS location during emergencies. Environmental noise and mobile processing limits remain challenges. Krishnakaarthick Thirunavakkarasu, Deepa Nataraj, Chandrika Gandhi Selvakumar, Rithika Palanisamy — *Shield: The Veilguard Framework for AI-Powered Offline Women Safety*: The study proposes an offline AI framework for women's safety. AI processing works locally without depending fully on internet connectivity. GPS, emergency detection and secure communication support quick response. Hardware limits, storage and AI model updates are challenges. E. Priya, Madhumitha Dasarathy, Kiruthika S, Madhushri L — *ABHAYA – Secure Communication Device for Women Safety*: ABHAYA is a dedicated device designed for emergency communication. GPS, wireless communication and emergency switches help send alerts quickly. Location information is shared with trusted contacts during emergencies. Hardware maintenance, battery usage and communication infrastructure are limitations. A. Elakya, Kowsalya M, Muni Malini P, Meenakshi Sundaram T. M — *Smart Human Safety Device and Health Monitoring System*: The paper combines personal safety with health monitoring features. Heart rate and body temperature are monitored during emergency conditions. GPS and wireless communication help share location and health information. Sensor accuracy, battery consumption and maintenance are major concerns. T. Nithya, V. Chandrasekaran, Jayaharini S, Bharath J, Mahalakshmi S, Jai Krishnan S — *Enhancing Nighttime Safety through Secure Edge-AI Surveillance System for Urban Women's Protection*: The research uses Edge AI surveillance to improve women's safety at night. Cameras and AI-based image analysis detect suspicious activities. Alerts are generated when possible threats are identified. Camera coverage, privacy and processing limits affect performance. Atharva Atterkar, Chaitanya Undale, Pranjal Pandit, Prasad Ghadge, S. Rajgade, A. Yenkikar — *Women Safe Route Navigation System*: The paper focuses on finding safer routes instead of only the shortest routes. Crime data, GPS and historical safety information are used for route selection. Users can share live locations with trusted contacts during travel. Route accuracy depends on updated crime data and reliable GPS services. Vishnu Priya K R, Sanjana Murthy, Chaitra M. — *SheSafe: Empowering Women's Safety through Intelligent Technology*: SheSafe combines AI, GPS, emergency alerts and intelligent monitoring in one app. Features include live location sharing, panic activation and emergency communication. The system reduces manual actions during dangerous situations. Network availability, GPS accuracy and smartphone resources can affect performance. Mallegowda M, Sharanya M S, Yash Suresh Gavas, Venella Rudraraju — *SakhiSuraksha: An AI and IoT-Based Intelligent Emergency Response System for Women's Safety*: SakhiSuraksha combines AI, IoT, GPS and cloud communication for women's safety. Connected devices collect information and AI identifies emergency conditions. Alerts with location details are sent to family members and responders. Internet dependency, privacy and hardware scalability are concerns. Deepika Gade, Naga Dasaradha Kamanuru, R. Harika, T. Akarsha, T. Greeshma — *AI-Powered Movable Train Platform for Real-Time Station Management*: The paper presents an AI-based system for improving railway station safety. AI monitors platform conditions, train positions and passenger-related risks. Sensors and real-time analysis support faster operational decisions. Infrastructure cost, maintenance and sensor reliability are challenges. R. Srinidhi, C. Valarmathi, S. Praveena Rachel Kamala — *SRIVA: A Smart Reactive Vitality Analyzer for Critical Events*: SRIVA is a health monitoring system for detecting critical physical conditions. Wearable sensors monitor vital signs and identify abnormal conditions. Emergency alerts with location details are sent to caregivers or contacts. Sensor accuracy, battery life and wireless communication are challenges. R. Pavithra, R. Ahalya, C. Shuruthika — *Discreet AI-Powered Women's Safety App with Audio Recognition and Emergency Automation*: The paper presents a discreet safety app using AI-based audio recognition. The system detects screams, panic sounds and other distress patterns. GPS location and emergency alerts are shared without manual interaction. Noise, privacy, device limitations and false detections remain challenges.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 8, August 2026

DOI: 10.17148/IARJSET.2026.13820

III. COMPARATIVE ANALYSIS

Paper Title	AI / Technology Used	Key Features	Advantages	Limitations
Next-Gen Smart Wearable Device for Women and Children's Safety Using Edge AI	Edge AI, IoT, GPS, Wearable Sensors	Real-time monitoring, emergency alerts, location tracking	Fast response, offline processing, enhanced privacy	Battery limitations, hardware cost
Smart Scream and Panic Detection System for Women Using AI	Machine Learning, Audio Recognition	Scream and panic sound detection, automatic alerts	Detects emergencies without manual activation	Reduced accuracy in noisy environments
Women's Safety App Based on AI: Sound Anomaly Detection	AI, Sound Anomaly Detection, GPS	Abnormal sound detection, emergency notification	Automatic distress detection, mobile accessibility	False alarms due to environmental noise
Shield: The Veilguard Framework for AI-Powered Offline Women Safety	Edge AI, Offline	Offline emergency response, secure communication	Works without internet, better privacy	Limited storage, hardware resources
ABHAYA – Secure Communication Device for Women Safety	GPS, Wireless Communication	Emergency communication	Reliable emergency communication	Extra hardware and maintenance
Smart Human Safety Device and Health Monitoring System	IoT, Health Sensors, GPS	Health monitoring, emergency alerts	Combines health and safety	Sensor accuracy, battery issues
Enhancing Nighttime,Safety throughSecure Edge-AI Surveillance System	Edge AI, Computer Vision	Surveillance, suspicious activity detection	Real-time monitoring, low latency	Privacy, infrastructure cost
Women Safe Route Navigation System	AI, GPS, Route Analysis	Safe route recommendation, live tracking	Safer crime-aware navigation	Depends on updated data
SheSafe: Empowering Women's Safety Through Intelligent Technology	AI, Mobile Computing, GPS	Panic alerts, live location, emergency assistance	Multiple features in one app	Internet dependency, GPS accuracy
SakhiSuraksha: An AI and IoT-Based Intelligent Emergency Response System for Women's Safety	AI, IoT, Cloud, GPS	Automatic emergency response, monitoring	Quick alerts, intelligent decisions	Privacy, network dependency
AI-Powered Movable Train Platform for Real-Time Station Management.	AI, Sensors, Automation	Crowd monitoring, passenger safety	Better safety and efficiency	High deployment and maintenance cost

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 8, August 2026

DOI: 10.17148/IARJSET.2026.13820

SRIVA – A Smart Reactive Vitality Analyzer for Critical Events	Wearable Sensors, AI, IoT	Vital monitoring, emergency alerts	Early medical emergency detection	Battery, sensor reliability
Discreet AI-Powered Women's Safety App with Audio Recognition and Emergency Automation	AI, Audio Recognition, GPS	Automatic distress detection, emergency automation	Minimal user interaction	Noise sensitivity, privacy concerns

IV. RESEARCH GAP

The literature survey reveals that considerable progress has been made in developing AI-based women safety technologies; however, several research challenges remain unresolved. Most existing systems focus on a single safety feature such as panic detection, wearable monitoring, emergency communication, or safe navigation, limiting their overall effectiveness during complex emergency situations.Many proposed solutions rely heavily on continuous internet connectivity, making them less effective in remote or low-network areas. Audio recognition systems often experience false alarms due to environmental noise, while wearable devices face limitations related to battery life, hardware cost, and long-term reliability. Privacy protection, secure data management, and integration of multiple sensing technologies also remain important concerns. Furthermore, only a limited number of studies combine Edge AI, health monitoring, intelligent audio recognition, GPS tracking, and automated emergency response within one comprehensive platform. Addressing these challenges can contribute to the development of more reliable, intelligent, and user-friendly women safety systems.

V. DISCUSSION

The papers reviewed show that AI can be useful for improving women's safety and providing faster emergency support. Different studies use sound detection, GPS, health monitoring, surveillance and route selection for identifying risky situations. Audio-based systems can detect screams or panic sounds, but background noise may cause false alerts. GPS-based systems also face problems when location information is not accurate. Edge AI can reduce internet dependency, while wearable systems provide additional health information. However, many existing systems focus on only one main safety feature. Some solutions also need extra hardware, which increases cost and maintenance. Combining different inputs such as sound, location and physical conditions can make the system more useful. A system with both automatic and manual emergency alerts can also help in different situations. Overall, the studies show a need for a simple and reliable AI-based women safety system.

VI. FUTURE SCOPE

The future system can be improved by combining audio detection, GPS, user activity and physical condition analysis. AI models can be trained with larger and more diverse datasets to improve detection accuracy. False alerts can be reduced by checking multiple signals before sending an emergency message. Offline AI can be added to support users during poor network conditions. The system can provide low-battery and location accuracy warnings during emergencies. Automatic alerts can include live location, nearby images and emergency contact details. Future versions can also support regional languages for easier use. The system can be extended with better privacy and secure data handling. Real-time risk levels can help users understand unsafe situations. Overall, future development can make the system more accurate, reliable and easier to use.

VII. CONCLUSION

Artificial Intelligence has emerged as a promising technology for improving women's safety through intelligent monitoring, automated emergency detection, real-time communication, and rapid emergency response. The thirteen research papers reviewed in this survey demonstrate the growing adoption of AI, IoT, Edge AI, wearable devices, health monitoring, GPS tracking, audio recognition, and surveillance technologies to enhance personal security.

Each study contributes unique solutions for addressing different safety challenges, including distress detection, emergency automation, secure communication, health monitoring, safe navigation, and intelligent surveillance. Despite

DOI: 10.17148/IARJSET.2026.13820

these advancements, several limitations remain, including internet dependency, false alarm generation, privacy concerns, battery constraints, and the absence of unified safety platforms.

Overall, the reviewed literature indicates that future women safety systems should integrate multiple AI-driven technologies into comprehensive and reliable solutions capable of operating efficiently under diverse real-world conditions. Such integrated systems can significantly improve emergency response, user confidence, and personal security while supporting the development of safer environments for women.

REFERENCES

[1] V. Priya K. R., S. Murthy, and C. M., "SheSafe: Empowering Women's Safety through Intelligent Technology," in *Proc. 2026 Int. Conf. on Intelligent and Innovative Technologies in Computing, Electrical and Electronics(IITCEE)*,2026,doi:10.1109/IITCEE67948.2026.11394257.

[2] M. Mallegowda, S. M. Sharanya, Y. S. Gavas, V. Rudraraju, and A. Kanavalli, "SakhiSuraksha: An AI and IoT-Based Intelligent Emergency Response System for Women's Safety," in *Proc. 2026 Int. Conf. on Intelligent and Innovative Technologies in Computing, Electrical and Electronics (IITCEE)*, 2026, doi: 10.1109/IITCEE67948.2026.11394029.

[3] P. R., A. R., and S. C., "Discreet AI-Powered Women's Safety App with Audio Recognition and Emergency Automation," in *Proc. 2026 IEEE Int. Students' Conf. on Electrical, Electronics and Computer Science (SCEECS)*, 2026,doi:10.1109/SCEECS68810.2026.11430037.

[4] E. Priya, M. Dasarathy, K. S., and M. L., "ABHAYA – Secure Communication Device for Women Safety," in *Proc. 2025 Global Conf. on Information Technology and Communication Networks (GITCON)*, Belagavi, India, Aug. 2025,doi:10.1109/GITCON65266.2025.11378302.

[5] A. Atterkar, P. Ghadge, C. Undale, S. Rajgade, P. Pandit, and A. Yenkikar, "Women Safe Route Navigation System," in *Proc. 2025 8th Int. Conf. on Emerging Technologies in Computer Engineering (ICETCE)*, 2025, doi: 10.1109/ICETCE66848.2025.11388906.

[6] N. T., V. Chandrasekaran, S. Jayaharini, J. Bharath, S. Mahalakshmi, and S. Jai Krishnan, "Enhancing Nighttime Safety through Secure Edge-AI Surveillance System for Urban Women's Protection," in *Proc. 2025 2nd Asia Pacific Conf. on Innovation in Technology(APCIT)*, Mysore, India, 2025.

[7] D. Gade, N. D. Kamanuru, R. Harika, T. Akarsha, and T. Greeshma, "AI-Powered Movable Train Platform for Real-Time Station Management," in *Proc. 2026 7th Int. Conf. on Mobile Computing and Sustainable Informatics (ICMCSI)*,2026,doi:10.1109/ICMCSI67283.2026.11412510.

[8] A. Elakya, S. Pooja, M. Kowsalya, T. M. Meenakshi Sundaram, and P. Muni Malini, "Smart Human Safety Device and Health Monitoring System," in *Proc. 2025 5th Int. Conf. on Evolutionary Computing and Mobile SustainableNetworks(ICECMSN)*,2025,doi:10.1109/ICECMSN68058.2025.11382948.

[9] R. Srinidhi, C. Valarmathi, and S. Praveena Rachel Kamala, "SRIVA – A Smart Reactive Vitality Analyzer for Critical Events," in *Proc. Int. Conf. on Electronics and Renewable Systems (ICEARS)*, 2026, doi: 10.1109/ICEARS67481.2026.11416792.

[10] K. V. Priyadharshini, M. Nitharshana, S. Prasika, S. Prithiba, and M. Sowmiya, "Women's Safety App Based on Artificial Intelligence: Sound Anomaly Detection," in *Proc. 2025 10th Int. Conf. on Smart Structures and Systems (ICSSS)*,2025,doi:10.1109/ICSSS66939.2025.11346397.

[11] H. V., K. Kirubasankar, and R. K. R., "Next-Gen Smart Wearable Device for Women and Children's Safety Using Edge AI," in *Proc. 2025 Int. Conf. on Next Generation Computing Systems (ICNGCS)*, 2025, doi: 10.1109/ICNGCS64900.2025.11183396.

[12] K. Thirunavakkarasu, R. Palanisamy, D. Nataraj, and C. G. Selvakumar, "Shield: The Veilguard Framework for AI-Powered, Offline Women Safety," in *Proc. 2025 IEEE Silchar Subsection Conf. (SILCON)*, 2025, doi: 10.1109/SILCON67893.2025.11327402.

[13] P. Sharma and T. J. Jebaseeli, "Smart Scream and Panic Detection System for Women using AI," in *Proc. 2025 4th Int. Conf. on Automation, Computing and Renewable Systems (ICACRS)*, 2025, doi: 10.1109/ICACRS67045.2025.11324333.

