AI and IOT based mobile application for women safety

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Abstract

The advancement of Artificial Intelligence (AI) and Internet of Things (IoT) technologies offers innovative solutions for enhancing women's safety. This abstract outlines the development of an AI and IoT-based mobile application designed specifically for women's safety. While relatively new as a cyber security discipline, the Internet of Things (IoT) as a business enabler has matured into a clearly defined set of use cases solving pressing business problems that deliver operational and cost benefits across many industries, such as healthcare, retail, financial services, utilities, transportation and manufacturing. The study aims to explore the various factors contributing to the safety concerns of female students and emphasizes the immediate need to bridge this awareness gap. The study is to establish an environment that not only accepts but also demonstrates the effectiveness of AI-driven safety solutions in protecting the well-being of college students.

Key features include automated emergency alerts to designated contacts and authorities, real-time location tracking, and intelligent voice-activated commands for immediate assistance. The application also incorporates community-based safety features, allowing users to share real-time safety information within their network. This innovative approach aims to provide a comprehensive and proactive safety solution, empowering women to feel more secure in their daily lives. The integration of AI and IoT in a mobile application marks a significant step forward in addressing safety concerns and fostering a safer environment for women. The rapid growth of capabilities and adoption of IoT technology has fueled a transformation in enterprise operations with IoT devices making up 30% of total devices on enterprise networks today. Rich data collected from these devices provides valuable insights that inform real-time decisions and deliver accurate predictive modeling. In addition, IoT is a key enabler of digital transformation in the enterprise, with the potential to drive up workforce productivity, business efficiency and profitability as well as the overall employee experience.

Despite the many advantages and innovations IoT technology enables, the interconnectedness of smart devices presents a substantial challenge to enterprises in terms of grave security risks arising from unmonitored and unsecured devices connected to the network. There is much immoral domestic abuse for women across the world. This is accelerated due to the absence of an effective tracking system. This study focused on a female's safety system focused on AI

correctly in crucial circumstances.

Keywords: Real-Time Location Tracking, AI-Powered Alerts, Emergency Response:

Introduction

Artificial Intelligence (AI) mimics human intellect by empowering machines to cogitate and unravel predicaments like humans. Artificial Intelligence (AI) and the Internet of Things (IoT) have opened new avenues for enhancing personal safety, particularly for women. Despite significant strides in societal awareness and legal frameworks aimed at protecting women, safety remains a paramount concern. Traditional safety measures often fall short in providing real-time assistance and proactive protection. This has led to the exploration of technology-driven solutions that can offer more reliable and immediate support.

AI and IoT technologies, with their capabilities for real-time data processing, pattern recognition, and connectivity, present a unique opportunity to revolutionize personal safety applications. By combining AI's analytical power with IoT's ability to interconnect devices, a new generation of mobile applications can be developed to provide comprehensive safety solutions. These applications can continuously monitor the user's environment, analyze potential threats, and initiate appropriate responses automatically. An AI and IoT-based mobile application for women's safety is designed to address these needs by offering features such as real-time threat detection, automated emergency alerts, location tracking, and community support networks. AI algorithms can analyze data from various sources, including wearable devices, smart phones, and environmental sensors, to detect signs of distress or danger. IoT devices can provide continuous monitoring and ensure seamless communication between the user, their contacts, and emergency services. This technology-driven approach not only enhances the efficacy of safety measures but also empowers women by providing them with tools that can actively protect them in various situations. The integration of AI and IoT in mobile safety applications represents a significant step forward in addressing the persistent challenge of women's safety, aiming to create a safer and more supportive environment for all.

Discussion

IoT security can be understood as a cyber security strategy and protection mechanism that safeguards against the possibility of cyber attacks which specifically target physical IoT devices that are connected to the network. Without robust security, any connected IoT device is vulnerable to breach compromise and control by a bad actor to ultimately infiltrate, steal user data and bring down systems.

The overarching challenge for security in IoT is that as large volumes of diverse IoT devices continue to connect to the network, a dramatic expansion of the attack surface is happening in parallel. Ultimately the entire network security posture is diminished to the level of integrity and

escalating challenges that are unique to IoT security, including: Inventory – not having clear visibility and context for what IoT devices are in the network and how to securely manage new devices. Threats – lack of well-embedded security into IoT device operating systems that are hard or impossible to patch. Data volume – overseeing vast amounts of data generated from both managed and unmanaged IoT devices. Ownership – new risks associated with the management of IoT devices by disparate teams within the organization. Diversity – the sheer diversity of IoT devices in terms of their limitless forms and functions. Operations – the unification crisis wherein IoT devices are critical to core operations yet difficult for IT to integrate into the core security posture. In addition to these challenges, 98% of all IoT device traffic is unencrypted, putting personal and confidential data at severe risk. Every IoT device on the network represents an endpoint which provides a potential point of entry for a bad actor to expose the network to outside risks. This includes the IoT devices you know about as well as the IoT devices you don't know about. For example, if infected with malware, IoT devices can be used as botnets to launch distributed denial-of-service (DDoS) attacks on the network the bad actor wants to bring down. However, unlike IT devices, a growing number of IoT devices are virtually invisible in enterprise networks, making it impossible to protect them all in the same way.

AI can analyze patterns to predict potential threats, enabling preemptive actions. Highlight applications that leverage AI for real-time monitoring, location tracking, and distress signal generation. The incorporation of AI in women's safety initiatives is paramount for creating a world where every woman feels secure and empowered. By leveraging the latest advancements in technology, we can collectively contribute to building a safer and more inclusive future. Together, let's embrace AI as a powerful ally in the fight for women's safety.

Future work

Access to safe and reliable public places, services, and infrastructures are the key areas that allow women and girls to participate actively in public activities and enjoy equal rights and opportunities. Creating awareness among employees on women's safety and their health is vital. Harnessing the true capabilities of Artificial Intelligence for women’s safety all around the world can be of ultimate success and importance. An AI and machine learning powered women's safety app can definitely help prevent sexual harassment, violence, and molestation around us. The integration of AI technology is being done with the objective of achieving 100% security for women, identify criminals, combat criminal activities and provide prompt assistance to women and children during emergencies.

GPS: Global Positioning System GPS module acts as the satellite and receives the data frequently and transmits similarly to the RS32.It is developed by the US department of defense (DOD).The antenna input of the module receives the GPS signals, and a complete sequential data message with the area, acceleration, and time information is pressed at the serial line. Panic Button: This is a standard 12mm square momentary button. It is used as emergency Switch. This button is great for user input, it contains 4 pins. If the victim is in danger, by pressing the switch the gets activated along with buzzer.

readymade loudspeaker contains two pins to attach it to power and ground, which commonly used to indicate if the button has been pressed then the buzzer vibrates.

Future work in the development and enhancement of AI and IoT-based mobile applications for women's safety involves several key areas of focus developing more sophisticated AI algorithms for better threat detection and prediction. Utilizing machine learning to continuously improve the accuracy of detecting potential threats and false alarms. Incorporating natural language processing (NLP) for more effective voice-activated commands and responses. Expanding the range of IoT devices that can be integrated with the application, such as smart jewelry, wearable, and connected home devices. Improving the interoperability between different IoT devices and platforms to ensure seamless communication and data sharing. Enhancing battery life and power efficiency of IoT devices to ensure reliable long-term usage. Developing real-time analytics capabilities to provide immediate feedback and alerts. Enhancing the application's ability to coordinate with local law enforcement and emergency services for quicker response times. Implementing to create safe zones and automatically trigger alerts when users enter or leave these areas. Strengthening data encryption and security measures to protect user information and ensure privacy. Implementing robust authentication mechanisms to prevent unauthorized access to the application and user data. Ensuring compliance with legal and regulatory standards related to data protection and user privacy. Improving the user interface to make it more intuitive and user-friendly. Incorporating feedback from users to continuously refine and enhance the application's features. Ensuring the application is accessible to users with disabilities through features like voice commands and easy navigation. Developing community-based safety networks where users can share real-time safety information and support each other.

Creating forums and platforms for users to report safety concerns and incidents, this can then be analyzed for trends and insights. Implementing social features that allow users to rate the safety of different locations and share their experiences. Integrating educational resources within the application to raise awareness about personal safety strategies and self-defense techniques. Providing training modules for users to familiarize themselves with the application's features and how to use them effectively in emergencies. Ensuring the application can be scaled to accommodate a large number of users without compromising performance. Adapting the application to different cultural and regional contexts to make it effective globally. Collaborating with international organizations to promote the adoption of the application worldwide. Partnering with law enforcement agencies, NGOs, and community organizations to enhance the effectiveness and reach of the application. Engaging with policymakers to advocate for policies that support the use of technology in enhancing women's safety. Working with technology companies to integrate the latest innovations and ensure the application stays at the forefront of safety technology. By pursuing these areas, future work can significantly enhance the capabilities and impact of AI and IoT-based mobile applications for women's safety, contributing to a safer and more supportive environment for women around the world. first, we have to give the power supply to the Arduino board. gsm also needs an external supply. then we have to dump the code into the controller through USB cable. here code is embedded c, Arduino board support c

latitude and longitude to the predefined numbers by using gsm and GPS. if the switch is not pressed, then the sensor will check the positions(x,y, z-axis) of the person, if the positions cross the predefined limit, at that time also the message will also send to predefined numbers. The buzzer also would ring at both conditions. by using the internet of things the position of the person will be updated every 15 seconds. by using LCD we can visualize the output. The wifi module is also used for the IoT.

Conclusion

The proposed design will deal with critical issues faced by women during the night and provide security with advanced technology. While society may or may not change its mindset but this device is will help to feel women independent.

In the pursuit of creating a safer world for women, the integration of Artificial Intelligence (AI) has proven to be a revolutionary step. AI can analyze patterns to predict potential threats, enabling preemptive actions. Highlight applications that leverage AI for real-time monitoring, location tracking, and distress signal generation. The incorporation of AI in women's safety initiatives is paramount for creating a world where every woman feels secure and empowered. By leveraging the latest advancements in technology, we can collectively contribute to building a safer and more inclusive future. Together, let's embrace AI as a powerful ally in the fight for women's safety.

The devices switching from remote location removes the necessity of the person to be present near the device to operate it. This approach allows more than one person to control the device functionality and the authentication facility provided by the switch helps to reduce the fault correction time.

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