Smart Shoes With GPS and GSM Connectivity to Empower Your Every Step

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Abstract: *The main purpose of this paper presenting our revolutionary creation: Smart Shoes featuring GPS and GSM Connectivity, designed to bring peace of mind to every parent's heart. Imagine a world where worry takes a back seat as your loved ones embark on long journeys. With these remarkable shoes, equipped with advanced GPS guidance, you can ensure their safe passage with every step they take. When you are in trouble, just cross your feet in a special way and your location is sent to your family members. Wait, Even the family can get your location just by calling the shoe. When you call the SIM in the shoe, the shoe automatically hangs up the call and reverts back its current GPS location via SMS.*

Keywords: revolutionary, smart, shoes, GPS and GSM, tracking, location, innovation

I. INTRODUCTION

In today's modern era, women continue to experience insecurity when venturing out due to the escalating prevalence of crimes such as violence, harassment, and abuse in our country[1]. Despite the booming corporate and IT sectors, where many women are employed even during night shifts, there remains a pervasive sense of vulnerability among working women. The proposed device serves as a safety system designed to provide assistance during moments of crisis[2].introducing our revolutionary Smart Shoes, designed to empower every step you take with cutting-edge technology. These innovative shoes are embedded with GPS and GSM connectivity, reshaping the way you navigate and remain in touch while on the move[3]. with integrated GPS functionality, our Smart Shoes offer pinpoint location tracking, enabling you to boldly embark on new paths and excursions with confidence. Whether you're jogging, trekking, or strolling through the city, you'll always have precise knowledge of your whereabouts and the most efficient route to your destination. but that's not all our Smart Shoes boast GSM connectivity, ensuring uninterrupted communication even when venturing off-grid. By transmitting and receiving data via cellular networks, you can stay seamlessly connected to loved ones, friends, and emergency services, providing reassurance no matter where your journey leads[4].

These smart shoes are powered by Arduino Pro Mini technology, enhancing their capabilities and versatility. with Arduino Pro mini[5], you have full control over the shoe's functionality, enabling endless possibilities for customization and personalization. For tracking we used Adafruit FONA 808 miniwith GPS+GSM connectivity[6], coupled with Arduino Pro Mini technology and gesture control using a Hall effect sensor[7], represent the pinnacle of footwear innovation. They redefine what it means to walk with purpose, providing not only practical functionality but also a glimpse into the future of wearable technology.

II. LITERATURE REVIEW

Considering the problems mentioned, a few models have been suggested to help lessen those same issues.

The concern over women's safety has led to the creation of innovative solutions like the smart shoe with an emergency alert system. This shoe is designed to give women added protection in unsafe situations. Researchers introduced this idea in their paper[8]. Similarly, Researchers have introduced the Smart Foot Device to address women's safety

concerns. In today's society, women often face insecurity and harassment in public spaces. This device, discreetly integrated into footwear, uses IoT technology to send alerts when activated, providing a solution to enhance women's safety[9].

The authors offers insights into developing an Arduino-based alert system for enhancing women's safety. This system is specifically designed to address the safety concerns faced by women by utilizing Arduino technology[10]. Wearable devices, especially smart shoes, have evolved with sensors, vibrating motors, and GPS for user comfort. Some can even recognize daily activities. The authors in this paper discusses a Smart Shoe System for Women's Safety and Defense, emphasizing integrated intelligent tracking[11].The paper proposes an IoT-based smart bracelet for women's security, addressing the prevalent issue of crimes against women in India. It introduces a wearable device consisting of Raspberry Pi Zero, a buzzer, and a switch for activation. By simply pressing a button, the system sends the user's current location to pre-registered contacts and the police, enhancing safety and providing real-time evidence for swift action against perpetrators[12].

Researchers developed a navigation-based safety device for women. It triggers alarms automatically in emergencies, even if the user can't activate it manually. Using GPS and GSM technology, it tracks location and sends distress signals to neighbors and registered phone numbers. This research offers a promising solution to enhance women's safety by utilizing technology effectively[13].

In previous works, researchers utilized various sensors for GPS and GSM connectivity. However, today, we employ Adafruit FONA 808 mini, which integrates GPS and GSM connectivity into a single device.

III. PROPOSED METHODOLOGY

This paper suggests a new technology to protect women. It focuses on their security so that they never feel helpless. The paper consists of various modules such as GSM, GPS, Arduino pro mini. The basic idea of the project is Inside the shoe, there are GPS and GSM modules that combinedly send the location to the emergency contact. The main controllers used in this project are Arduino pro mini. There are GPS and GSM modules connected to Arduino pro mini[14].

just cross your feet in a special way and your location is sent to your family members. Wait, Even the family can get your location just by calling the shoe. When you call the SIM in the shoe, the shoe automatically hangs up the call and reverts back its current GPS location via SMS. simultaneously, GPS and GSM modules are activated with the help of Arduino pro mini. GPS module calculates your exact location by knowing the latitude and longitude position[15],whereas Basically GSM module Enables wireless communication over cellular networks and sends the location[16]. Fig 1: Circuit Diagram of the model.
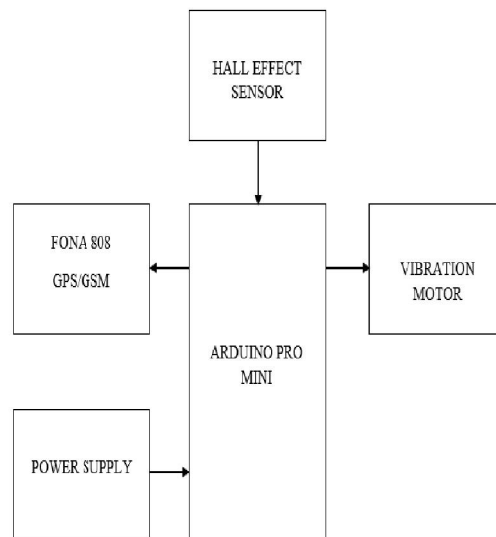

Fig 1: System block Diagram

IV. RESULTS AND DISCUSSIONS

- When the user crosses their feet in a specific way, it activates the hall sensor.
- Arduino with GPS module collects longitude and latitude.
- GSM module sends location to a provided mobile number.
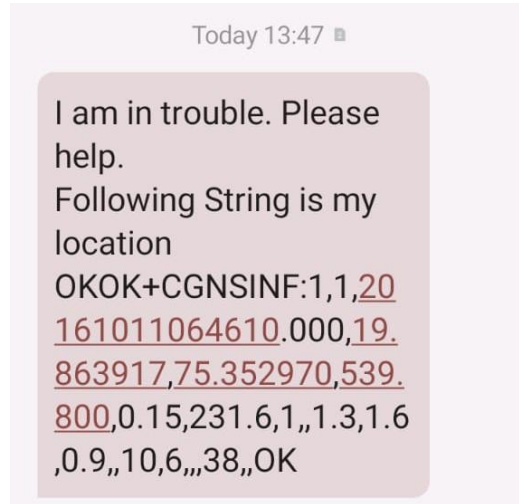- In the message, the location will be given with the alerting message.

Fig 2: Snapshot of Sending Text Message & Location from FONA 808 Module.

V. CONCLUSIONS AND FUTURE SCOPE

This project was designed to provide security for women in all dangerous scenarios. The project system shows various factors such as tracking, messaging services and contact services. This paper dis-cusses different techniques used for women's safety against fraudulent people. She was sending text messages to ensure that close relatives and police get alerted to the victim's location. Children's Safety: In addition to improving the conditions in terms of women's safety in India, this project can also be used for parents to detect their children's location.

IEC 60601 is a series of standards for the basic safety. The smart device may use a microcontroller, GSM, and GPS module to send notifications and current location of women to various mobile numbers in their contact. Lots of ideas can be added to this work in order to increase its functionality. For example, other sensors adding more accuracy for heart rate sensors. Added to that, testing this prototype on a large population to identify all system issues in order to get a better performance in upcoming versions is of high interest.

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