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SHAKTI: Women Safety Device

Mrunal Kapse[1], Kapse Yadhav[2], Rajlaxmi Dudhabhate[3], Prof. Omkar Mudegaonkar[4]
Padmabhooshan Vasant Dada Patil Institute of Technology, Pune

***Abstract:** In our Country, even though it has a superpower and economic development, there are still many crimes against women. The atrocities against women can be brought to an end with the help of our product "Shakti". This device is a security system, specially designed for women in distress. Method/Analysis: Using ESP32 for the hardware device is the most efficient and it consumes less power. We use radio frequency signal detectors to detect hidden cameras. Findings: We analyzed that there are no security devices for our total safety. The user has to carry multiple devices. We found an ALL-IN-ONE security device that has all the features in one click or Gesture. Applications/Improvements: In this paper we used ESP32 and Android applications in which both the device and the smartphone are synchronized using Bluetooth, hence both can be triggered independently. We can record audio for further investigation and can give an alert call and message to the pre-set contacts with the instant location every 2 minutes and can be tracked live using our application. A hidden camera detector is also a distinct feature using which we can ensure our privacy.*

I. INTRODUCTION

The introduction of our "Shakti" is a security device specially designed for women in emergency and distress. It is simple and easy to use and carries various functionalities. The numbers of smartphone users are turning into greater in amount all over the world. A smartphone has many applications that are useful to people in our "Shakti" and will become one of those. It is a personal safety product designed to keep you and your friends safe 24/7. It is packed with features for both everyday safety and real emergencies, making it an ultimate tool for all. This user-friendly application can be accessed by anyone who has installed it on their smartphone as well as who has our device. Our intention is to provide you with the fastest and simplest way to contact your nearest help. The basic approach (single click) is to intimidate the instant implementation i.e. it should have lesser computational time. By considering the above issues it can be concluded that to design a successful traffic sign recognition system, different types of image processing operations should be applied for the detection and classification of the traffic signs. So they can help human drivers to understand traffic rules and regulations and to increase road safety. Location and a distress message to the cops and the preset numbers, so that unfortunate incidents can be averted and to provide real-time evidence for the action against the perpetrators of crime against women. This device can also be miniaturized in the future and can be embedded in Bags, mobile phones, etc., in order to make this device. This can also help police departments to reduce the crimes, which are against women and the evidence can be used to trace the crime.

"Shakti" is a guide, which aids people to take preventive measures as soon as possible during:

1) Being stalked while walking.
2) Attempted physical or sexual assault.
3) Unsafe neighbors.
4) Domestic violence.
5) Hidden camera detector.

II. LITERATURE REVIEW

The innovative system for Security monitoring that is being suggested is based on research in wearable and combat equipment, help detect surveillance cameras. Consider the following important works that are key to the attainment of this aim:

1) Women Safety Device and Application-FEMME:

The FEMME system provides a robust, integrated safety mechanism for women, especially in emergencies. By combining multiple safety features into a single, portable device, it empowers users and ensures rapid response, communication, and evidence collection. The paper emphasizes the importance of technology in preventing crimes against women and ensuring personal security.

2) *"A Smart Wearable Device for Women Safety Using IoT" – IEEE Conference Paper*:

- Summary: This paper describes the outlined purposes a smart wearable using GPS, GSM, and sensors for real-time tracking and SMS alerts.
- Tech Used: Arduino Uno, GSM SIM900, GPS NEO-6M, panic button.
- Limitations:
  - No support for audio or video recording.
  - No voice keyword detection.

3) *"Bluetooth Controlled Safety System for Women with Live Tracking" – IJRASET*:

- Summary: This research examines and evaluates the possibility of using a mobile-connected system that alerts emergency contacts and shows live location.
- Tech Used: HC-05 Bluetooth, Arduino, GPS module.
- Limitations:
  - Requires the phone to be near.
  - Not autonomous.

These works further serve as a persuasive basis for the increasing significance of device in the field of Women Safety and monitoring system that we are proposing.

III. PROPOSED APPROACH

Figure 3 Represents the circuit diagram of the device that we proposed in this paper. Using the ESP32 Microcontroller the device is designed in which the GSM, GPS, Bluetooth, LM393 Module, ISD1820(Voice Recording Module), and RF detector are connected. The whole device just runs with a total of 5V is enough.

Figure 4 represents the prototype of the device which we initially made and can be miniaturized in the Future for real-time use. In this system, a Web Application is Used to find the location and send the Location to the guardians, SOS Message, and track your Phone additionally we use a technique of clicking the button you can trigger the system or by the gesture of Shouting “Help” to send the emergency message with location to guardians and Police.

A. *Advantages of the Proposed System*

1) GPS tracking feature tracks the user lively when you are on the move after triggering the emergency button.
2) It records audio, which can be used for further investigations.
3) When the battery is running low, it automatically sends the location of the pre-stored contacts.
4) The second distinct feature is, that it also detects hidden cameras which help in our privacy.
5) This device works without internet connectivity

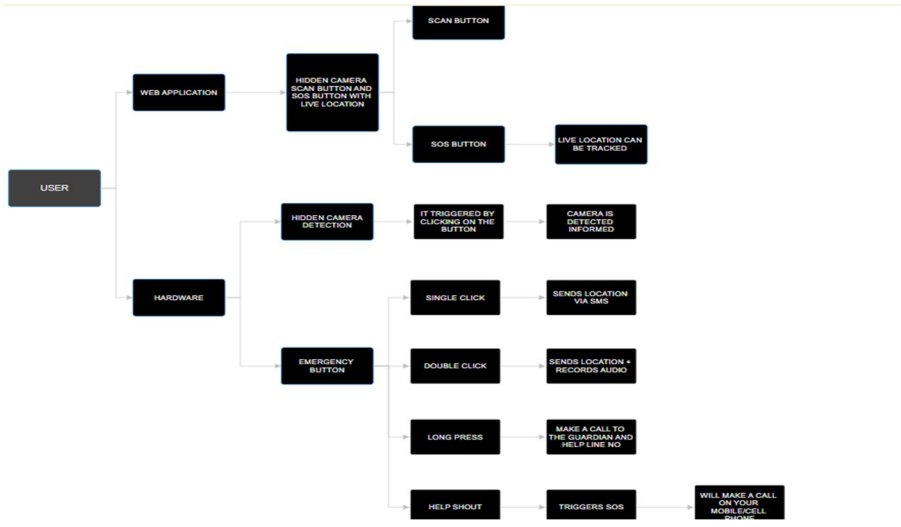

Fig 3:- System Architecture

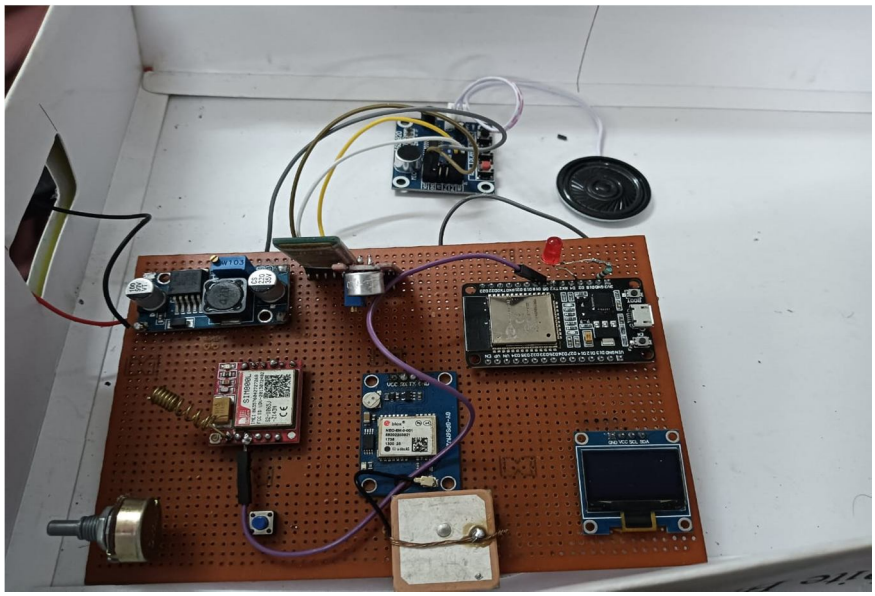

Fig 4:- Complete Prototype

The system architecture consists of several layers, each responsible for specific tasks:

1) Web App Functionalities

[1] SOS Feature

- Audio Recorder: Starts recording audio in real-time. Captures ambient sound that may serve as evidence.
- Video Recorder: Starts recording video using the phone's camera.Visual evidence of surroundings or perpetrator.
- Hidden Camera Detector: Checks for the presence of spy or hidden cameras. Ensures privacy and safety in private spaces (e.g., hotel rooms).

[2] Once SOS is activated:

- The user is alerted (via notification, sound, or vibration).
- GPS Location is fetched and converted into a Maps URL. Location is formatted in a template message.
- SMS Alerts: The app sends this information via SMS to pre-set emergency contacts every 2 minutes. Ensures continuous tracking and updates.

2) Hardware Functionalities:

[1] ESP32 Microcontroller (Main Controller)

- Controls all peripherals and executes the safety logic.
- Manages communication between modules (GPS, GSM, OLED, Bluetooth, etc.).
- Hosts a web server for triggering actions remotely.

[2] GPS Module (Neo-6M)

- Provides real-time latitude and longitude.
- Sends location via GSM (SMS) or over the web when SOS is triggered.

[3] GSM Module (SIM808 or SIM800L)

- Sends emergency SMS with location to predefined contacts.
- Makes a call when a long button press is detected.

[4] ISD1820 Voice Recording Module

- Records short emergency audio (via a button or double press).
- Helps provide audio evidence or distress messages.

[5] Sound Sensor (LM393 or similar)

- Detects loud sounds like shouting "HELP".
- Triggers SOS when a loud noise is detected, using the keyword logic.

[6] Bluetooth Module (HC-05)

- Receives remote SOS trigger via Bluetooth from the mobile app or another device.
- Monitors for keywords "SOS" or "HELP" to activate emergency mode.

[7] Hidden Camera/RF Detector Sensor

- Detects hidden surveillance devices using radio frequency (RF).
- Triggers LED alert and send a notification on detection.

[8] OLED Display (128x64 SSD1306)

- Displays: Status messages (e.g., "System Ready", "SOS Sent", "Camera Detected") and Real-time GPS coordinates.

[9] Push Button

- Detects:
  - Single Press: Sends location via SMS.
  - Double Press: Sends location + records audio.
  - Long Press: Makes a call.

IV. FUTURE SCOPE

1) Wearable Integration: The device could be miniaturized and integrated into wearable forms, such as smart jewelry, watches, or clothing, making it even more discreet and convenient for users to carry and access in emergencies.

2) Enhanced Connectivity Options: Future versions could incorporate additional communication methods, like Wi-Fi and LoRa (Long Range) technology, enabling seamless connectivity across various networks and increasing reliability in remote or urban areas with limited GSM coverage.

3) AI-Based Threat Detection: Artificial intelligence and machine learning algorithms could be implemented to analyze real-time data from sensors, recognizing potential threats based on patterns and providing early warnings to users.

4) Improved Battery Life and Power Efficiency: Advancements in battery technology and low-power components could extend the device's operational time, allowing for long-term use on a single charge, which is essential for users in areas with limited access to power.

V. CONCLUSION

Our primary goal of this project is to ensure every woman in our society feels safe and secure. According to the survey in India, 53% of working women are not feeling safe - Women working the night shift (Bangalore-56%, Chennai-28%, Hyderabad-35%, Mumbai-26%). Overall 86% of working women in India, women facing hurdles are high in Delhi, Mumbai, Hyderabad, Kolkata, and Pune compared to other places. Shakti can play a major role by providing women with a safe environment in all situations for example (detecting hidden cameras, physical threats, harassment, robbery, and stalking). By implementing real-time applications and a device, we can solve the problems to an extent. With further research and innovation, this project is used as a small wearable device like a watch, pendant, etc.

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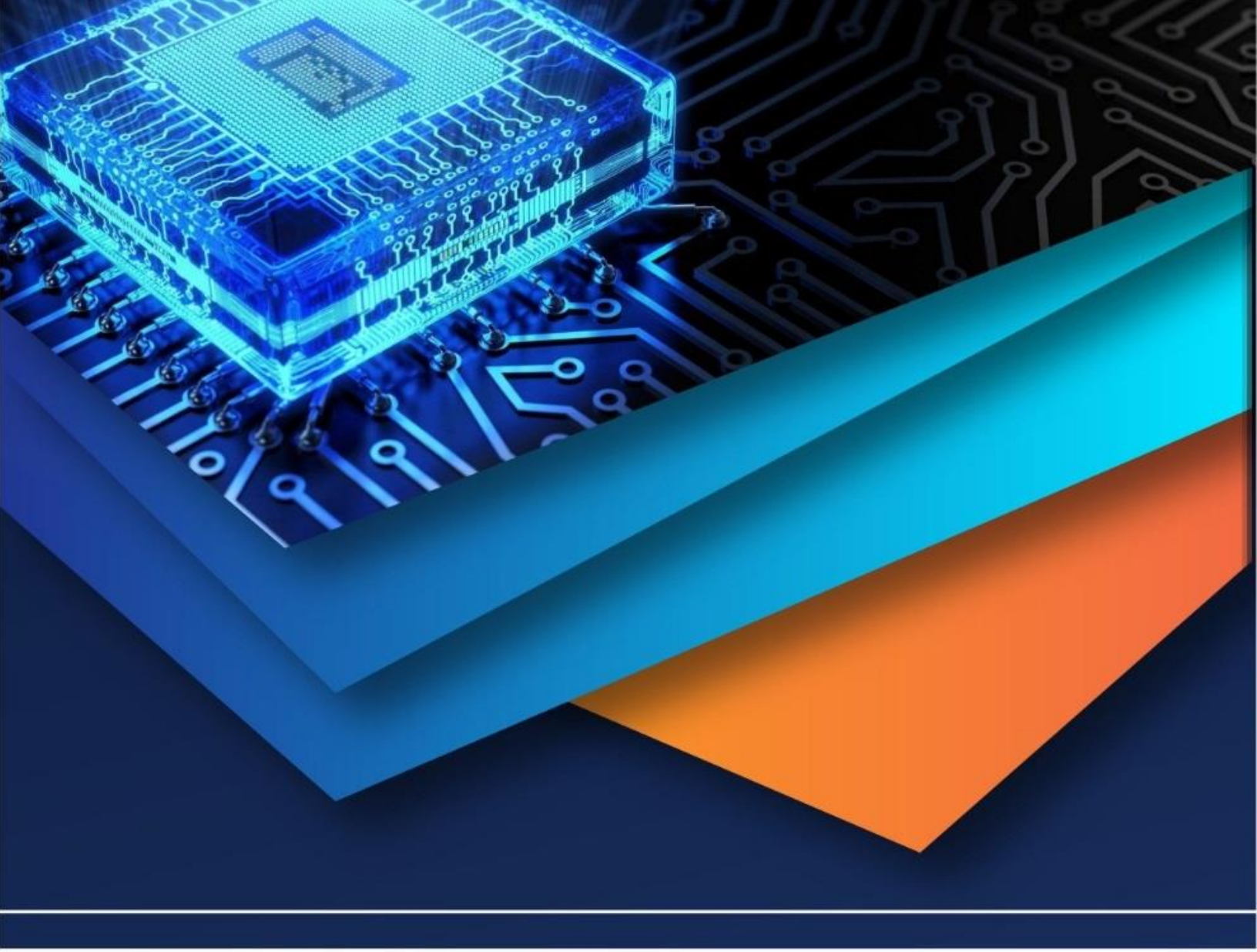

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