



LOW-COST DESIGN OF WOMEN'S SAFETY JACKET WITH GPS AND GSM INTEGRATION

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Abstract— This paper presents a cost-effective safety jacket for women, integrating an electric shock circuit that incapacitates assailants on contact during emergencies, enhancing self-defense. By combining GSM and GPS modules, the jacket sends distress messages with precise coordinates to preset contact of family, friends, and law enforcement for swift aid. An audible alert system using a buzzer notifies nearby individuals, prompting immediate assistance. This innovation merges electric defense, advanced communication, and quick response, contributing to women's empowerment and safety.

Keywords: *Safety jacket, electric shock circuit, GSM, GPS, self-defence, emergency communication, women's security.*

I. INTRODUCTION

In a world of technological advancement, safety remains a fundamental concern, especially for women who often face various threats. In response to this major problem, this article attempts to introduce an advanced solution that is to provide women with affordable safety jacket. This is an effective means of self-defence while establishing effective communication channels in an emergency. Essentially, the safety suit provides superior response to distress situations through integrated shock circuitry. Cleverly embedded in the jacket, the circuit is designed to incapacitate potential attackers in the event of physical contact, providing women with a practical mechanism to prevent danger. Safety jackets take a proactive approach to safety by combining personal clothing with self-defence technology.

In addition to its self-defence capabilities, the safety jacket showcases advanced communication features. Through the incorporation of GSM and GPS modules, the wearer gains the ability to transmit distress messages to preconfigured contacts, ensuring swift notifications to family members, friends, and law enforcement agencies. The integration of GPS technology supplements this communication by sharing precise latitude and longitude coordinates, facilitating rapid response and rescue. complementing the communication suite, an audible alert mechanism adds another layer of security. A buzzer installed within the safety jacket emits a distinctive sound that draws the attention of individuals nearby,

signaling an ongoing emergency and encouraging immediate assistance. The research encapsulates the fusion of technological innovation and social empowerment, aiming to redefine women's safety in the modern era. By merging electric Défense, advanced communication capabilities, and rapid response mechanisms, the safety jacket represents a tangible step toward fostering a secure environment for women, enabling them to navigate life's challenges with greater confidence and peace of mind.

II. STATISTICS OF VIOLENCE AGAINST WOMEN

The research was driven by alarming statistics that highlight the long-lasting problems women face when it comes to safety. Across the world, cases of assault, persecution and violence against women continue to cast a shadow on social progress. According to the World Health Organization (WHO), approximately one-third of women in the world experience physical or sexual violence by a partner or sexual violence by another person in their lifetime. Additionally, the crime rates of sexual harassment, rape cases remain depressingly high, leaving many women fearful of public spaces.

III. LITERATURE REVIEW

This section presents a summary of notable studies in the domain of women's safety systems using innovative technologies.

Hyndavi et al. [1] proposed a “Smart wearable device for women's safety that employs IoT technology”. The system utilizes pressure, pulse-rate, and temperature sensors to automatically detect potential threats through outlier detection, thereby triggering an emergency alert mechanism.

Mishra et al. [2] introduced a novel “Women's safety system based on voice recognition”. By integrating GSM technology and voice recognition, the system is designed to create a secure environment in public places, where a switch activation is employed to ensure user control.

Ramachandiran et al. [3] conducted “A comprehensive survey on women's safety devices utilizing IoT”. The study not only presents various techniques for women's safety but also highlights the existing drawbacks and opportunities in this field.

In a study by Muskan et al. [4], a “Women's safety device was developed using IoT and machine learning”. This device is designed to personalize safety measures by learning the individual patterns of temperature and heartbeat, determining alarm thresholds accordingly.

Devi et al. [5] introduced an “IoT-based safety system for women” incorporating GPS and GSM circuits. The system integrates an alarm and a shock-generating device, ensuring quick response and communication in emergency situations.

Harikiran et al. [6] proposed a “Smart security solution for women based on Internet Of Things(IOT)” multi-device integrated solution for women's safety. The system consists of a wearable smart band continuously communicating with a smartphone, enabling real-time monitoring and access to the internet for instant assistance.

Bhadula et al. [7] presented the "Stree Aatmanirbharta Jacket," an IoT-based women's safety system. This innovative jacket incorporates a distress button that, when pressed, sends alerts to pre-defined emergency contacts. Additionally, LED lights and an alarm contribute to increasing situational awareness.

Tanwar et al. [8] “Design of Low-Cost Women Safety System using GPS and GSM”. The system can send SMS alerts to registered mobile numbers and record voice snippets as evidence in case of emergency situations.

These studies collectively highlight the efforts towards creating effective women's safety systems by leveraging IoT, wearable technology, voice recognition, and GPS-GSM integration. They emphasize the ongoing commitment to developing innovative solutions that enhance women's security and contribute to safer societies.

IV. DESIGN

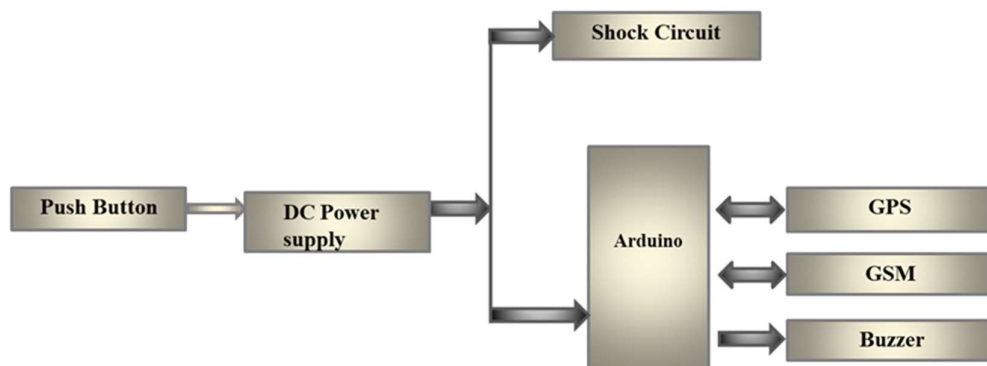


Fig 1. Block Diagram

Jacket shock module: The jacket has hidden electric conducting nodes which gives an electric shock of 5-6 milli amperes of current. The shock circuit is powered using a 24V battery and whenever there is a security concern arises, the safety button can be pressed which is been placed under the jacket. Once the circuit is turned ON, If the assailant tries to hold or attack the victim experiences an electric shock with mild painful sensation.

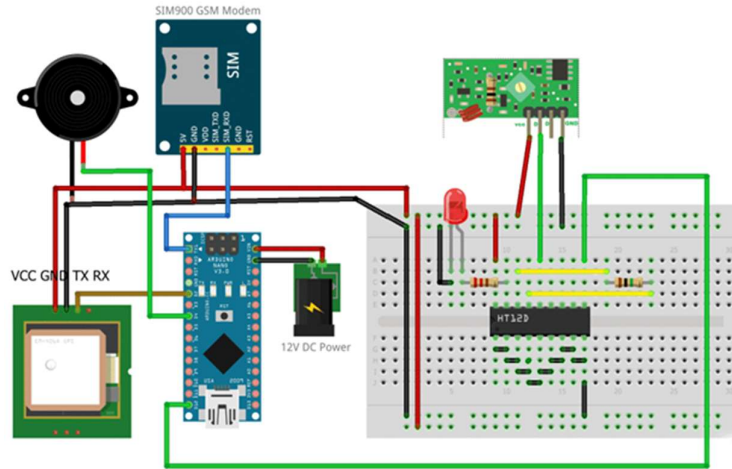


Fig 2. Circuit Diagram

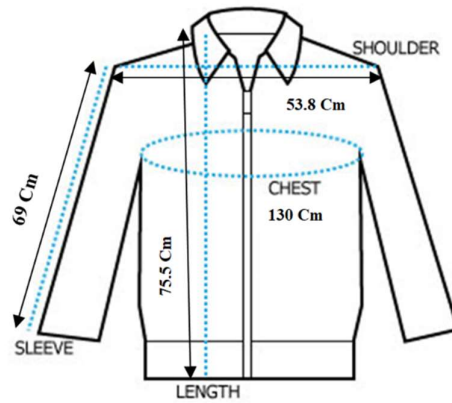


Fig 3. Proposed 2D CAED Model

V. RESULTS

The Inside view of the safety jacket is shown in Fig 5 and the GSM triggered SMS sent to the registered mobile number is shown in Fig.7. GPS module will track the live location of the victim and it will update the location on the webpage as shown in Fig 6.



Fig 5. Inside wiring view of the of Safety Jacket

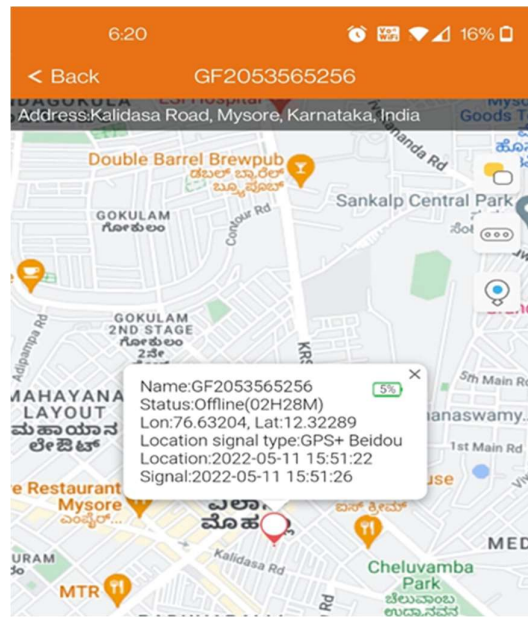


Fig 7. SOS Message from the GSM Module

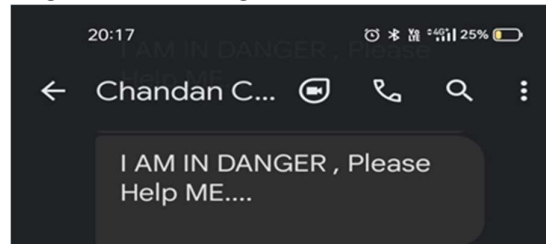


Fig 6. Latitude and Longitude data of GPS Module

VI. CONCLUSION

In this proposed work, an affordable safety jacket is developed for women safety especially in risky situations. With this circuit, women can actively protect themselves and feel more secure when walking alone at night. An emergency response system helps in reducing the crime rates against women.

VII. REFERENCE

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