Smart handbag with enhanced women's safety using cutting-edge technology

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Abstract

A recent survey shows that 30% of women in developed countries fear going out because of violence happening to them. To ensure their safety in public places, a smart handbag is designed, which provides enhanced security for them. The handbag is developed in such a way that it operates in wireless mode so that it can be controlled remotely without any human need. Also, the smart bag includes GSM and GPS technology for tracking the needy one. This technology provides a sense of security for women in public spaces, ensuring their safety and well-being. But the tools that use only these technologies for their operation are insecure and inefficient. The proposed handbag has an alternate approach for wireless control of a device by incorporating a fingerprint identification module, which increases the authenticity of the device and enables multiple users to control the device with the integration of hardware that makes a system that endlessly communicates their location using GPS to their known men's nearby and police station via GSM network. This system is incorporated with a camera module that captures images; further, the images are classified to check whether the threat is due to humans, animals, vehicles, etc., using a learning algorithm. For enhanced security, the smart bag is equipped with an electric shock generator and siren that give instant defensive response to potential attackers and provide a space for the women to escape. All these modules are integrated in the Arduino UNO controller, which triggers the entire functionalities; therefore, with all these advancements, the smart handbag provides safety to women by instant alert, location sharing, etc.
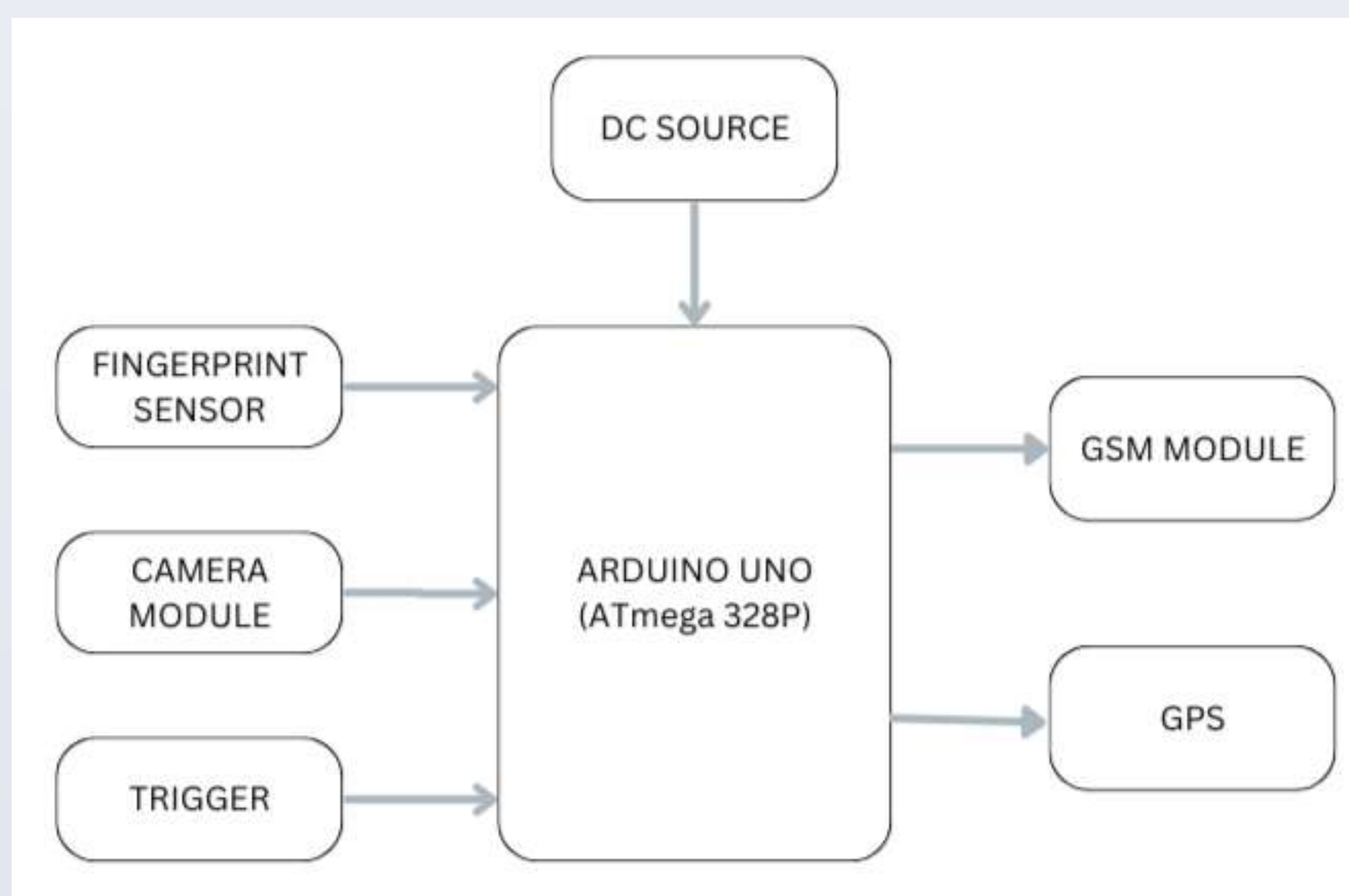
1.Design of Smart Handbag

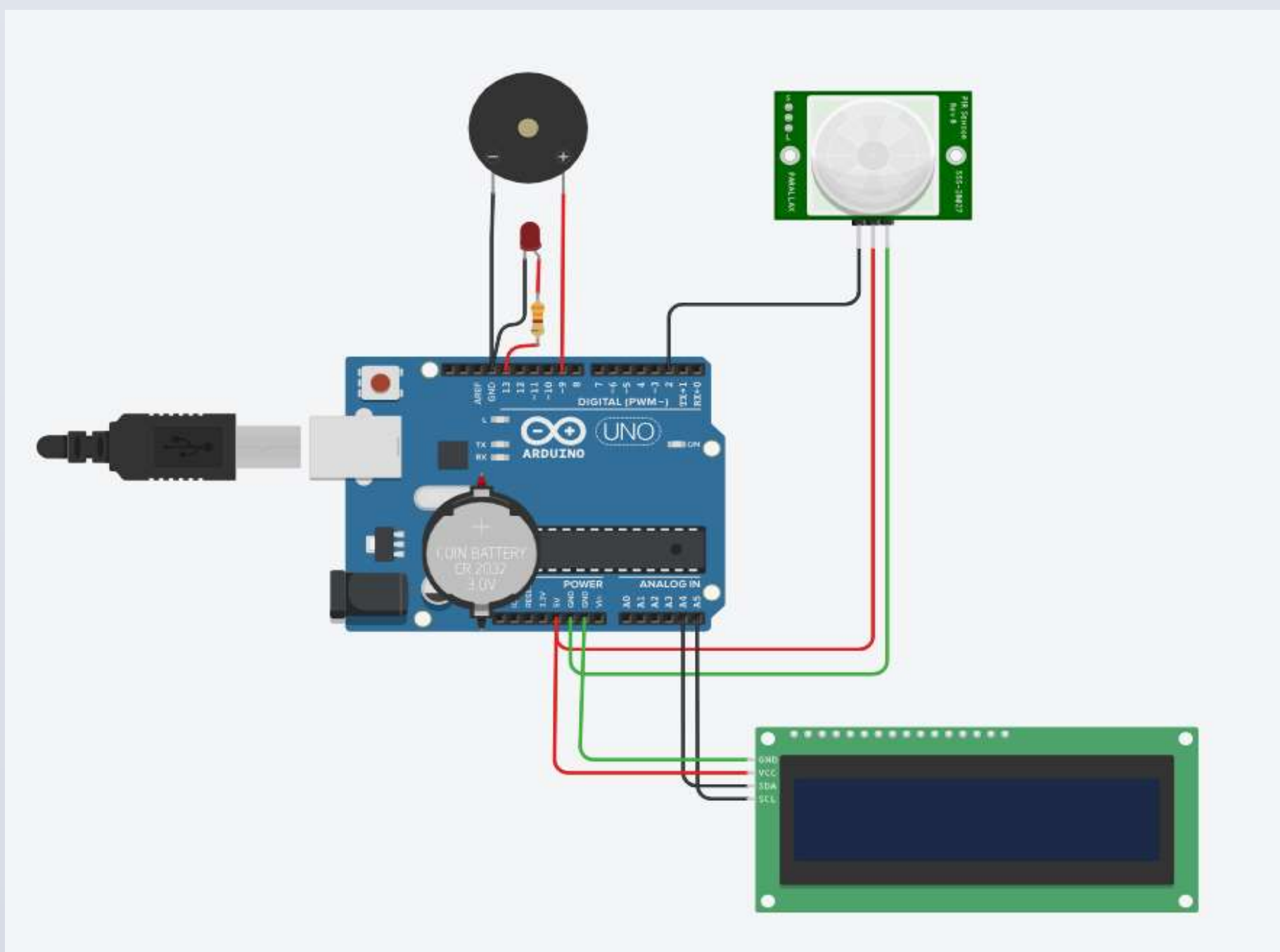**Fig. 1. Block Diagram of Smart Handbag**

2. Simulation Work

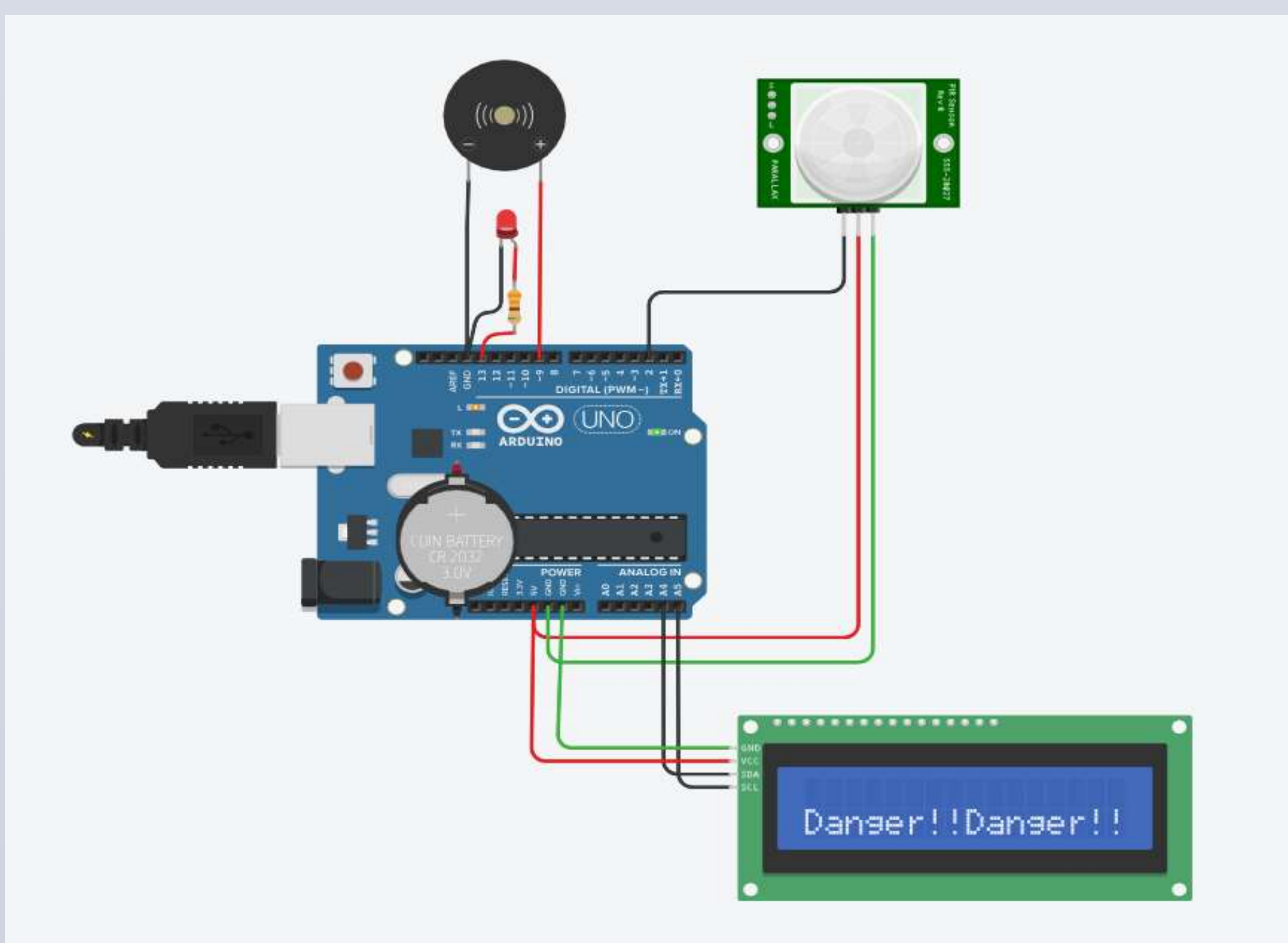**Fig. 2. Simulation in OFF state**

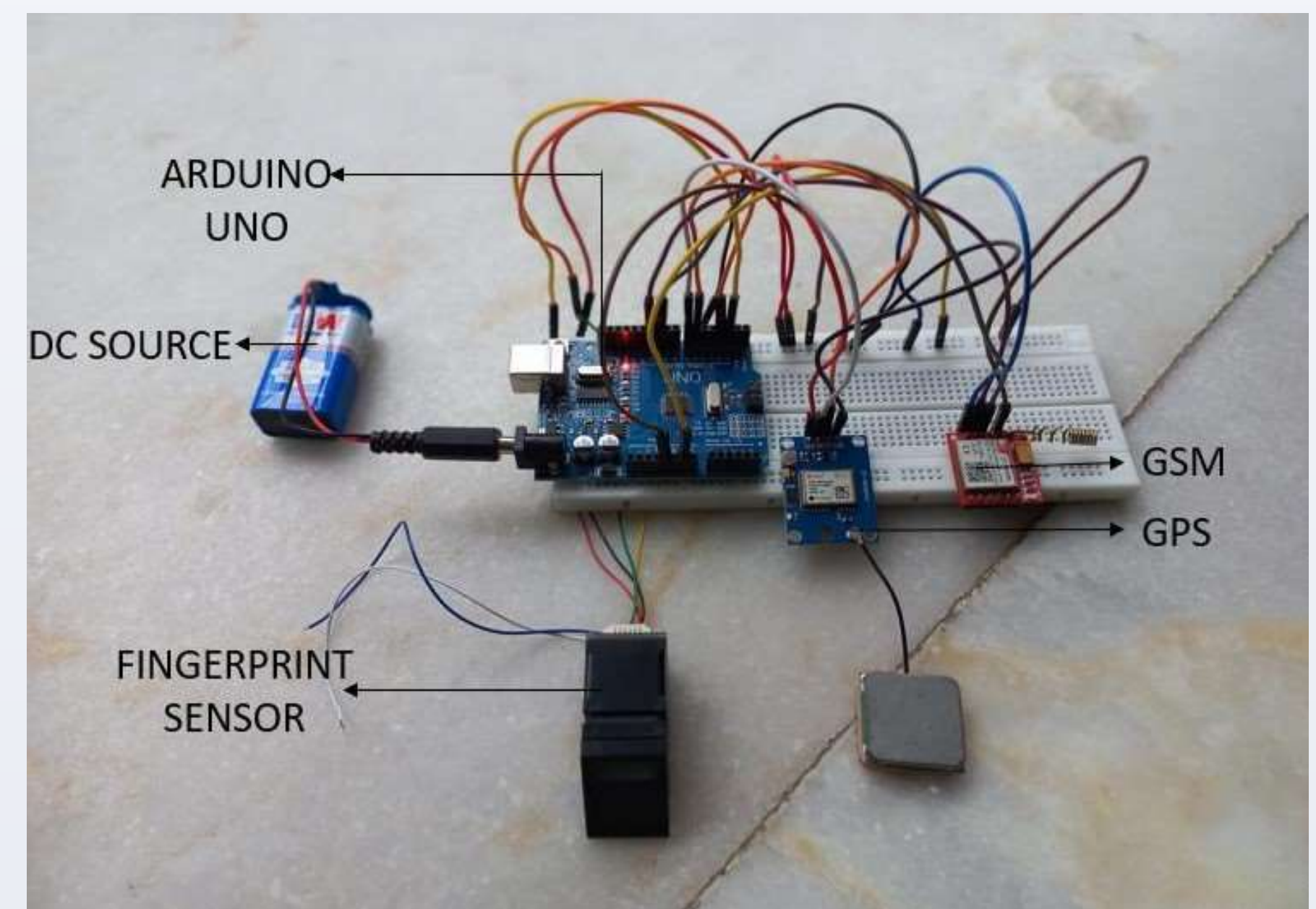**Fig. 3. Simulation in ON state**

3. Real Time Implementation

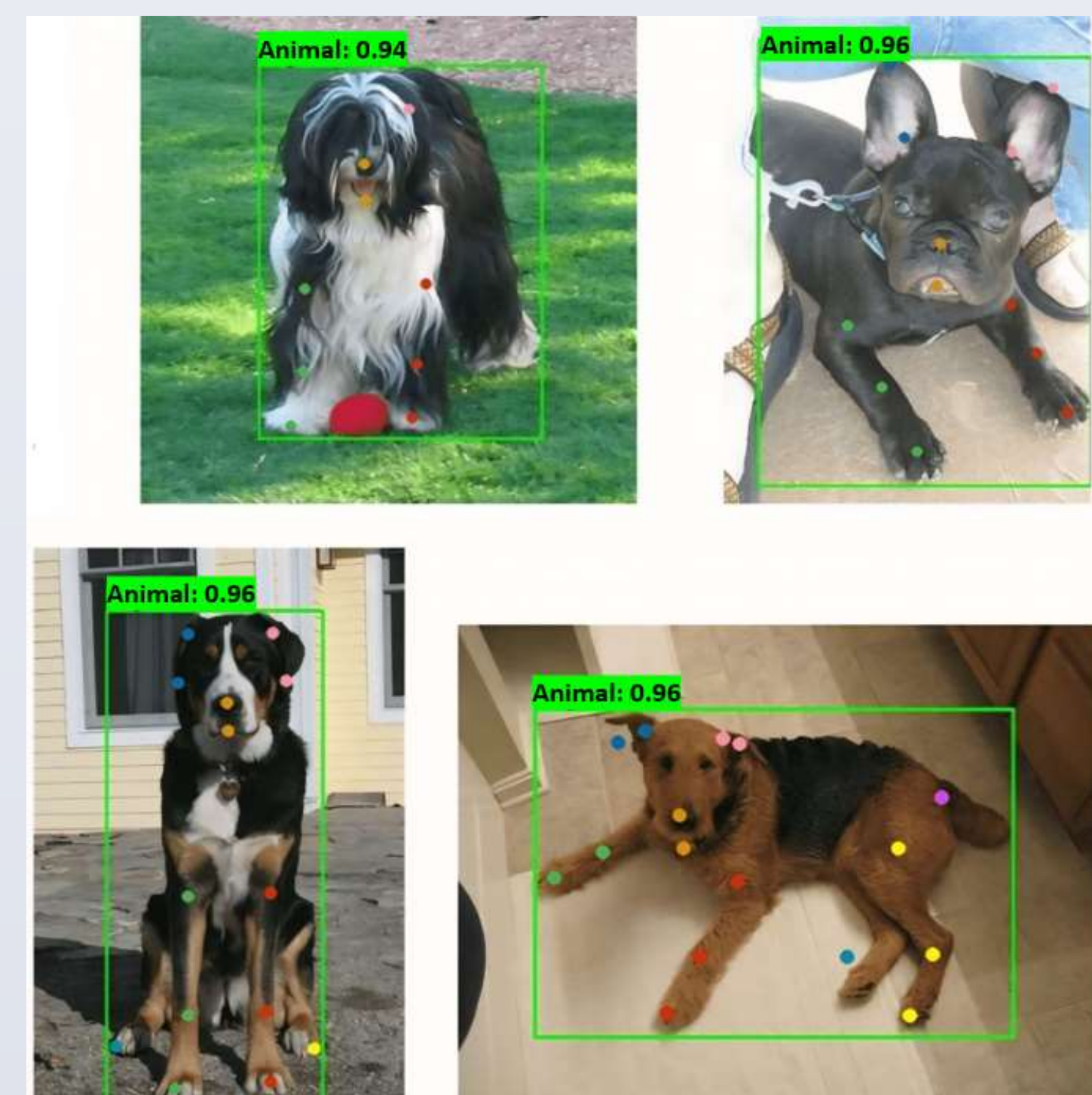**Fig. 4. Prototype Model of Smart Device (Handbag)**

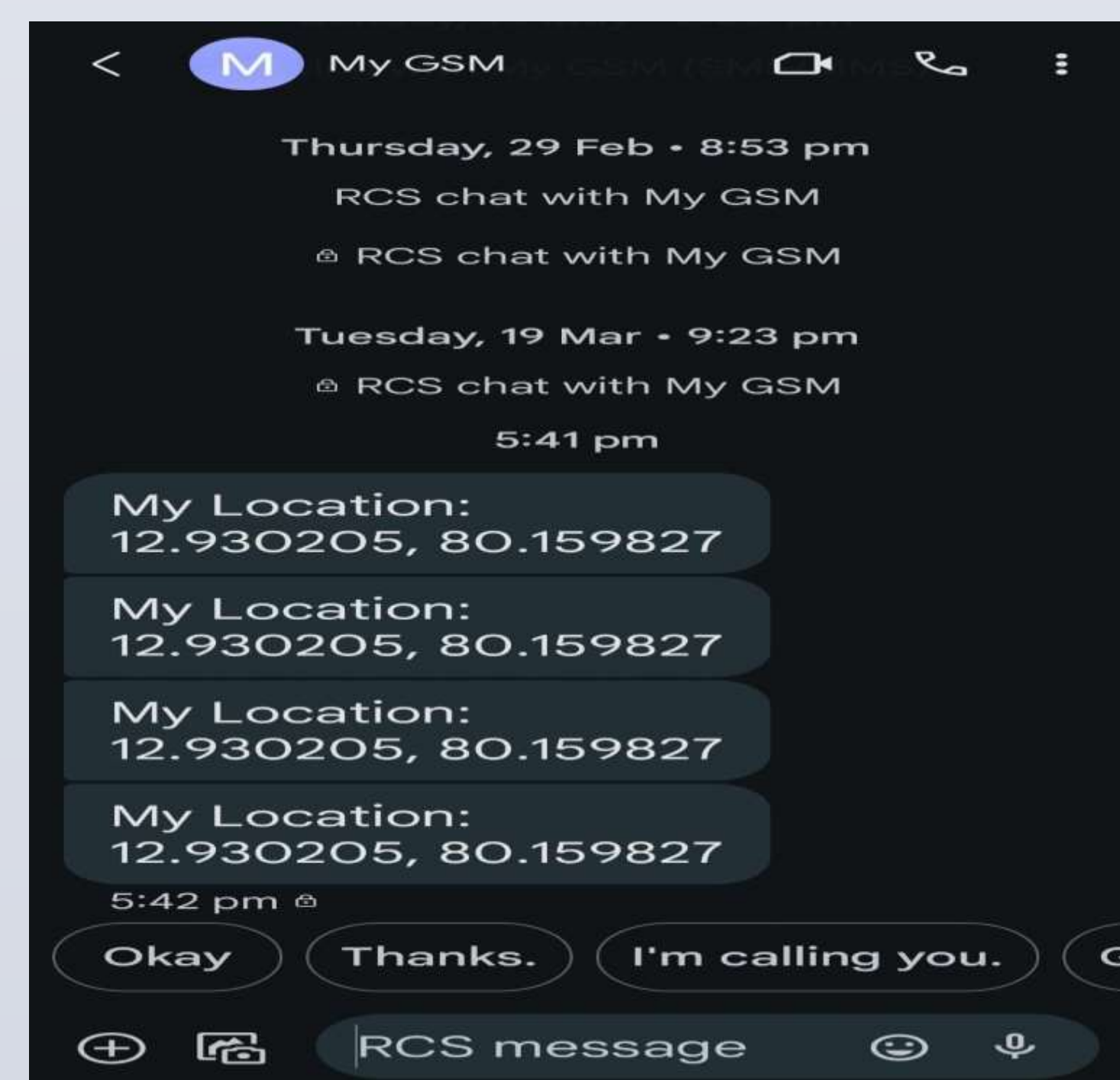**Fig. 5. Image Classification Process**

Fig. 6. Alert Messages from Proposed Smart Hanadbag

Conclusion

In olden days, women afraid to go out alone but now the growth of a smart handbag for women's safety, integrating a fingerprint sensor, GPS, GSM, camera, and an Arduino Uno, represents a significant stride in leveraging technology to address real-world safety concerns. This amalgamation of features not only provides an intuitive means for women to signal distress but also ensures that only the authorized user can activate the distress signal, thus minimizing false alarms and unauthorized use.

The inclusion of GPS technology enables precise location tracking, facilitating rapid response and assistance in emergencies by promptly notifying predefined contacts and nearby police stations. Through meticulous hardware setup, software development, and user interface design, the smart handbag promises a seamless and intuitive user experience, crucial for effective utilization, especially in high-stress situations. Nonetheless, it's imperative to prioritize safety and privacy throughout the development process, implementing safeguards to protect user data and prevent misuse of the device. By empowering women with tools to enhance their security and facilitate swift response during emergencies, this works not only holds the potential to make a tangible impact on individual lives but also contributes to broader efforts aimed at promoting safety and well-being in society.