Surveillance Auto Humanoid Bot

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Abstract

Development of an advanced defense surveillance bot integrates multiple technologies to enhance real time monitoring and situational awareness in defense scenarios. This bot is controlled wirelessly using a Fly-Sky transmitter-receiver system, providing robust and secure communication for remote operations. For enhanced situational alerts, the ESP8266 module is utilized to send notifications through Telegram. User gives a bot additional command using this data. Fly-sky or Arduino Uno is microcontrollers are used to temporarily control robots. Esp32 web camera is utilized for facial recognition. In a processing system, necessary faces are already registered. Robot will not react if it detects a registered face. Gun will fire and respond appropriately if it identifies an unregistered face. Pistol will aim at an unregistered face. Gyroscope controls a web camera's aiming in y-axis, x-axis, upward, and forward dimensions to safeguard soldiers. This enables it to identify any faces inside a border that are not registered. Automatically targets an unregistered face by a gun triggering system Robot temporary control can be done manually or automatically. Application of auto-target detection in defense is the main emphasis of this study. Automated gun fire system that uses sensors and a controller to target anyone inside a high-security area's boundary. This technology, which aids in military operations, allowed unregistered army personnel to cross borders. Combination of these technologies results in a versatile and reliable surveillance bot capable of performing in dynamic and challenging defense environments, providing both real-time visual data and instant notifications to support decision-making and operational efficiency.

Keywords: *Ultra-sonic sensor; Esp32 web cam; fly-sky controller; Arduino Uno; Facial recognition Defense robot.*

1. Introduction

Create a sophisticated defense system that uses automations to strengthen border security. The robot is an electro-mechanical device that can be programmed to carry out a variety of physical tasks using an electrical circuit. Scientists create new concepts and robot innovations as a result of the steady advancement of diverse technologies The Primary goal of this project's implementation is to save troop lives. It is suggested for border and remote region surveillance. This robotic vehicle can operate in both autonomous and manual modes. It is controlled by an ultrasonic sensor for autonomous operation and uses the Internet as a communication link to identify humans and fires. The ESP32 module controls manual operation, and a cell phone is utilized to initiate video recording. While the impediment is detected using other sensors, such as an ultrasonic sensor. Via a web interface, the wireless defensive robot can be manually commanded. It will be essential to provide a single platform from which we can control our robot. We can monitor the video feed and adjust the motor's direction from the webpage.

Our robot is navigated based on real-time data obtained from Skype video calls, which may be started using a web interface. These kinds of technologies allow us to continuously monitor all of the opponent's operations in the border region. Reduce the number of soldiers stationed physically while attempting to reduce hazards and threats in border areas. Realize a robot-driven, scalable, autonomous system. Technology and strategic planning can be used to build an autonomous defense robot for use in warfare. Strategic military defense systems are the front line of national security in a time of changing threats and geopolitical complexity. To defend sovereign areas, dissuade enemies, and keep civilian populations safe, these complex networks of individuals, Strategic, and technologies are created. To improve security on a regional and international level, it entails fostering alliances, exchanging intelligence, and creating coordinated defense systems. With the aid of a controller and sensor-based automated gun firing system, this research focuses on the defense application of auto-target detection, which targets people within border areas in high-security areas. This technology, which aids in military operations, allowed unregistered army personnel to cross borders. When the robot detects the absence of a military squad, it sends a signal to a mobile device via notification. In that case, the commando should use a defense humanoid robot to signal an army to fire. [1-5]

2.1.Circuit Diagram

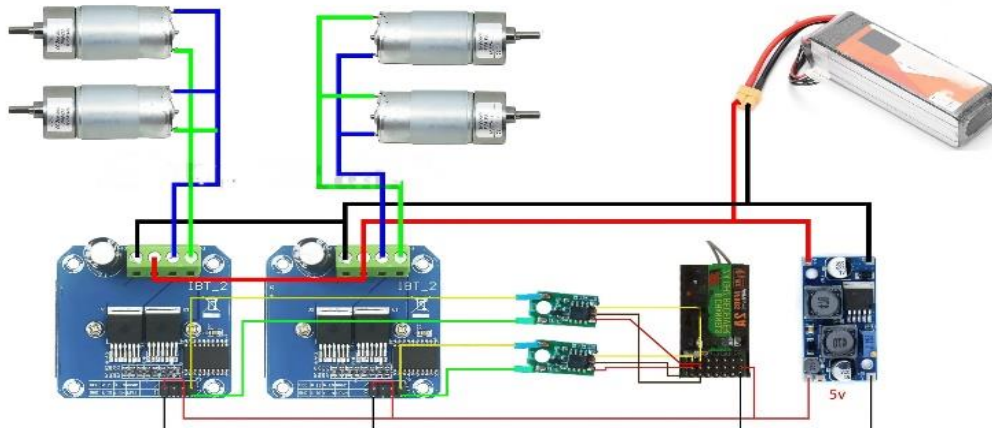The Circuit Diagram is shown in Figure 1

2. Methodology

A micro-controller is the foundation of this project. Where Servo motors, camera modules, automobile chassis, Arduino Uno, and sensors are used the camera that we employed to get the soldier's face. The amazing thing about Wi-Fi is that we can operate the entire setup from an Android app, and it uses the internet to present us with a live feed. As a result, we have an Android application that we created with Android Studio that features the ability to turn left, turn right, and go forward and backward. Data is captured by the camera module and sent via the internet to the intended device. The user gives the bot additional commands by utilizing this data. Microcontrollers such as the Arduino Uno and fly-sky are used to operate robots momentarily. Face detection is done using the Esp32 web camera. The processing system already has the necessary faces stored. The robot will do nothing if it detects the registered face. The gun will fire and take action for an unregistered face if it finds one. It will aim the gun toward the unregistered face. For military purposes, the gyroscope controls the aiming of the web camera in the y-axis, x-axis, upward, and forward directions to identify any unregistered faces within the boundary, ensuring the soldiers' safety and security. Robot momentary can be operated manually or automatically. An army can use this strategy to secure personnel while they are on the job. [6-10]

Figure 1 Circuit Diagram

2.2.Block Diagram

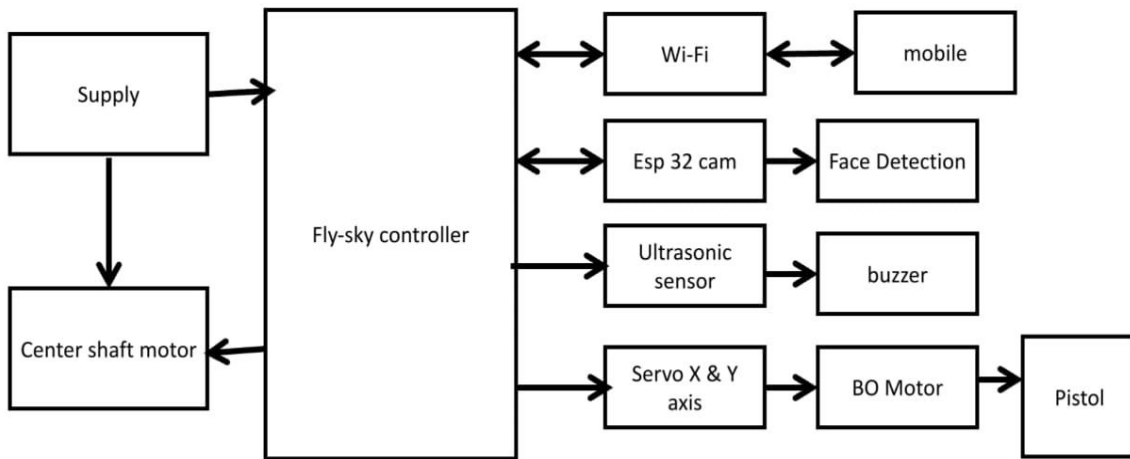The Block Diagram is shown in Figure 2.

Figure 2 **Block Diagram**

2.3.Final Product of Project

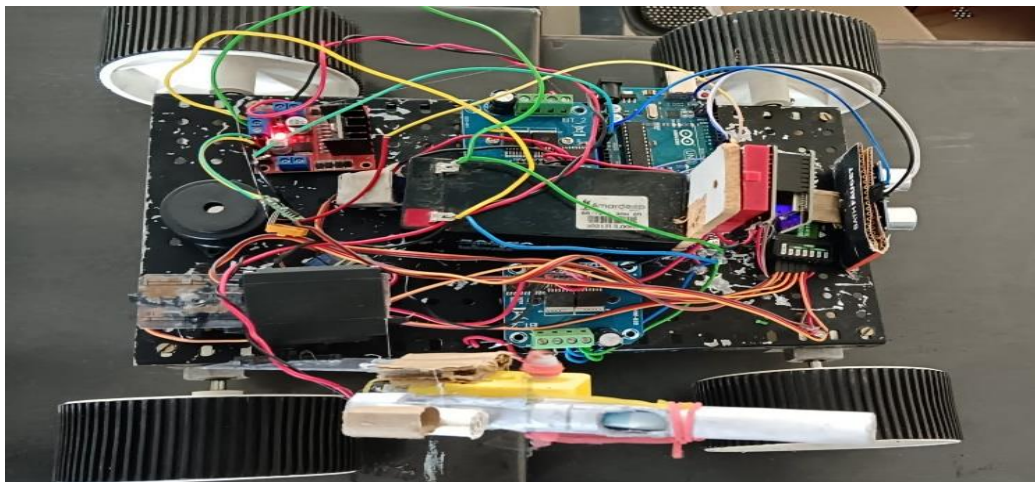Figure 2 shows the outcome of the Project.

Figure 2 **Outcome of a Project**

3. Results and Discussion

3.1.Results

Robots are mostly employed for surveillance in distant and border areas. This robot has both automatic and manual modes of operation. When an unidentified military unit crosses a border, the robots are triggered and shoot at them, offering soldiers a safer option. Robots contribute to human life protection by assuming risky activities; this may lessen battlefield losses and the psychological toll that soldiers take. Robots equipped with electronic warfare capabilities can cause strategic advantages by interfering with opponent communications and targeting systems. Concerns regarding autonomous decision-making in combat, particularly with regard to rules of engagement and civilian protection, have been raised by the use of military robots. [11-15]

3.2.Discussion

Surveillance humanoid robots are complex systems that use a variety of technologies to watch and

analyze their surroundings. They typically incorporate high-resolution cameras for visual data, microphones for audio input, and range of sensors like accelerometers and proximity sensors to gather comprehensive environmental data. This data is processed through sensor fusion technique to create a unified view of surroundings, which is then analyzed using image and audio processing algorithm. Communication with human operates is facilitated through user interfaces and cloud storage solutions, ensuring both immediate access and long-term backup. [16-20]

Conclusion

In order to conduct surveillance, we implemented a wireless military defense robot in this article. Without human intervention, this robot is employed to monitor the border area's current state. The route of this wireless defensive robot can be manually adjusted based on real- time data obtained from cellphone notifications. Modern armed forces have a revolutionary chance to improve operational performance, increase human safety, and respond to changing threats with agility and precision by using military defense robots. These cutting-edge systems have the ability to completely transform conventional military tactics because of their wide range of capabilities, which include combat support, logistics, and reconnaissance and surveillance.

Acknowledgements

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