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RASPBERRY PI BASED ANDROID CONTROLLED SURVEILLANCE ROBOT

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ABSTRACT

There is a huge need of security most especially in homes, workplaces, military area, borders. There has always been a high demand for security systems that could protect man, property, boundaries of nations. This project aims to provide surveillance in highly sensitive areas like border areas, terrorist hotspots without having to risk human life for the same. In this project, we use a raspberry pi which is controlled via an Android Bluetooth app and a 360-degree night vision camera for surveillance purpose. The camera provides a live stream of the video that it captures which can be seen in an android app as well. The App for the camera also a complete 360-degree rotation providing complete surveillance, also featuring provision saving video as well as the audio. The Spy robot chassis powered by a Raspberry Pi is interfaced with a Bluetooth module that communicates with an android app which sends direction controls to the chassis.

KEYWORD: Raspberry pi, Bluetooth module, Night vision camera, Motor driver IC, Crystal Oscillator, Resistors, Capacitors, Transistors, Cables and Connectors, Diodes, PCB and Breadboards, LED, Push Buttons, Switch, IC, IC Sockets

1. INTRODUCTION

In recent years, the advancement of robotics and wireless communication technologies has led to the development of innovative solutions for various real-world challenges. One such application is the creation of surveillance robots, which offer a versatile and efficient means of monitoring remote or hazardous environments. This project introduces an Android-based surveillance robot that incorporates a range of components including Pico, Bluetooth module, LCD display, L298 motor driver, and ESP32-CAM. By leveraging these components, the robot can be remotely controlled via a mobile application, providing users with the ability to navigate and monitor different environments in real-time. This introduction sets the stage for exploring the design, implementation, and potential applications of the surveillance robot within the realm of security, surveillance, and remote sensing.

2. PREVIOUS WORK

Wired Surveillance Systems: Traditional surveillance systems often rely on wired connections for communication and power supply. However, these systems are limited by the need for physical cables, which can be cumbersome to install and restrict the mobility of the surveillance robot. Moreover, wired systems are vulnerable to damage and tampering, limiting their reliability in dynamic environments.

Wi-Fi-based Surveillance: Some surveillance robots utilize Wi-Fi connections for communication, allowing for wireless control and data transmission. However, Wi-Fi networks may not always be available in remote or outdoor locations, limiting the operational range of the robot. Additionally, Wi-Fi signals can be susceptible to interference and signal degradation, affecting the reliability of the surveillance feed.

RF-based Control Systems: Radio Frequency (RF) control systems provide wireless communication between the robot and the controller. While RF offers greater range compared to Bluetooth, it can suffer from interference and signal loss, particularly in crowded or urban environments. Moreover, RF-based systems may require licensing and compliance with regulatory standards, adding complexity and cost to the deployment of the surveillance robot.

Autonomous Surveillance Drones: Drones equipped with cameras have been deployed for surveillance purposes, offering aerial views of remote or inaccessible areas. However, autonomous drones require sophisticated navigation systems and may be subject to regulatory restrictions regarding flight altitude and airspace regulations. Additionally, drones can be expensive to purchase and maintain, making them impractical for certain surveillance applications.

3. PROPOSED METHOD

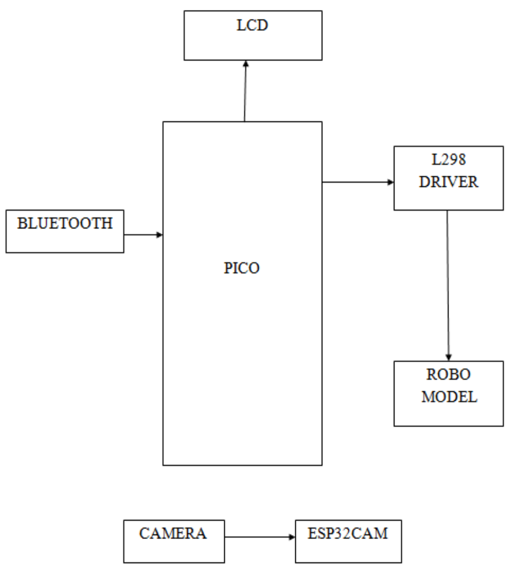

Fig. 3.1 Block diagram

This project presents the design and implementation of an Android-based surveillance robot equipped with a variety of components including Pico, Bluetooth module, LCD display, L298 motor driver, and ESP32-CAM. The robot is controlled via an Android application utilizing Bluetooth communication, allowing users to remotely navigate the robot and view live video feed captured by the ESP32-CAM. The L298 motor driver facilitates precise motor control for movement, while the LCD display provides real-time feedback on the robot's status and operational parameters. The integration of these components results in a versatile surveillance robot capable of remote monitoring and exploration tasks, offering potential applications in security, surveillance, and remote sensing scenarios.

4. CONCLUSION

In conclusion, the development of the Android-based surveillance robot represents a significant advancement in the field of robotics and remote monitoring systems. By leveraging modern technologies such as Pico, Bluetooth module, LCD display, L298 motor driver, and ESP32-CAM, this project has successfully created a versatile and efficient surveillance solution. The integration of these components enables seamless control of the robot via an Android application, facilitating remote navigation and live video streaming capabilities. The precise motor control provided by the L298 motor driver ensures smooth movement, while the LCD display offers valuable real-time feedback to the user. Overall, this surveillance robot holds immense potential for applications in security, surveillance, and remote sensing, providing enhanced capabilities for monitoring and exploration tasks in various environments. With further refinement and optimization, this project lays the groundwork for future advancements in robotic surveillance systems, contributing to the ongoing evolution of intelligent and autonomous technologies.

5. HARDWARE OUTPUT

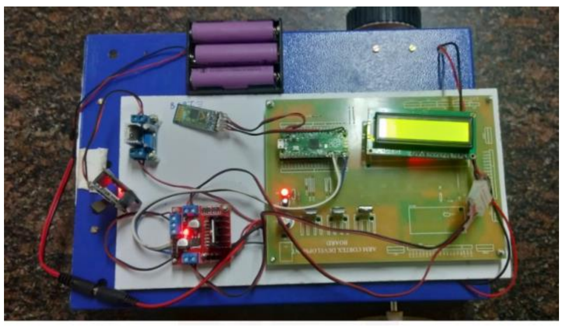

Fig. 5.1 Hardware Output

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