



IMPLEMENTATION OF RF- ROBOT FOR SURVEILLANCE SYSTEM USING ATMEGA MICROCONTROLLER

Abimanyu¹, Arya Babu², Nandana P³, Sanish V S⁴

¹ abi20rahul@gmail.com

² aryababu778@gmail.com

³ nandanair587@gmail.com

⁴ Assistant Professor , Department of Electronics& Communication Engineering ,Jawaharlal College of Engineering and Technology,Palakkad,India

ABSTRACT—

In modern surveillance applications, there is a growing need for versatile and efficient robotic systems capable of monitoring and securing diverse environments. Radio Frequency (RF) surveillance robots offer a promising solution by providing remote monitoring capabilities while navigating through challenging terrains and confined spaces. In modern surveillance applications, there is a growing need for versatile and efficient robotic systems capable of monitoring and securing diverse environments . Radio Frequency (RF) surveillance robots offer a promising solution by providing remote monitoring capabilities while navigating through challenging terrains and confined spaces.

INTRODUCTION :

The RF-based Surveillance Robot project leveraging Atmega microcontroller presents a pioneering approach towards bolstering security measures. This project endeavors to create a versatile, autonomous surveillance system capable of navigating through different terrains, collecting real-time data, and transmitting it wirelessly to a central monitoring station.

LITERATURE REVIEW :

DISTANCE CONTROLLED RESCUE AND SECURITY MOBILE ROBOT

The goal of creating a robot is to make life easier for humans by providing protection and acting as a helpful hand when needed. Among the many significant aspects of the technology in this rescue and security robot are its robotic automobile control via a cell phone and its automatic obstacle avoidance. It has the ability to detect smoke and gas and send out a text alert. The robot is capable of measuring distances, picking up and placing objects, and detecting bombs. For espionage purposes, a high-quality wireless video camera fitted on a robo vehicle with an omnidirectional vision and a stepper motor is used to transmit audio and real video signals. The receiver equipment can receive these audio and visual streams.

The study presents a Raspbian-based spy robot platform for border surveillance, utilizing IoT for remote monitoring and control. The system consists of a Raspberry Pi, night vision camera, and sensors. The system sends information about trespassers to users via a web server, and the camera captures moving objects. Users can control the robot using wheel drive buttons on the webpage. The robot's movement is controlled automatically through obstacle detection sensors, preventing collisions. This surveillance system can be customized for various industries.

IMPLEMENTATION OF SPY ROBOT FOR A SURVEILLANCE SYSTEM USING INTERNET PROTOCOL OF RASPBERRY PI

The main objective of this research is to develop a robot that can use wireless night vision cameras and It is possible to manually control robots with an Android Bluetooth application. The robot has a wireless camera with night vision integrated in, and it can relay videos of humans. The task assigned to this robot is to roam around and gather audio and visual information from its surroundings, then relay that information to the user. In this project, the robot is controlled using a mobile smartphone. This robot can gather data from a remote place and deliver it to a distant IoT cloud database. By sending orders through our Android device's Bluetooth software This study aims to create a low-cost robot that uses wireless night vision cameras and an Android Bluetooth application for manual control. The camera sends videos of people, collecting audio and video data from the environment. The robot can send data to an IoT cloud database and send commands via Bluetooth software on an Android phone. The low-cost microcontroller-based robot can move in various directions, making it suitable for remote monitoring and spying applications.

DESIGN OF SPY ROBOT WITH WIRELESS NIGHT VISION CAMERA USING ANDROID

Owing to the rise in terrorist activity globally, it is critical to manage and keep an eye on their operations and act swiftly to carry out any necessary plans. This study offers a smart robotic surveillance system based on the Global Positioning System (GPS) that uses a Raspberry Pi for remote sensing and security applications. This robotic device may be operated completely remotely using Android apps and an internet web browser. An object under consideration is disposed of and the surrounding environment is viewed by a camera that is gripped with a gripper. It is equipped with a GPS module and an ultrasonic sensor that aid in continuously tracking the location and measuring distance.: This paper presents a GPS-based smart surveillance robotic system using Raspberry Pi for security applications and remote sensing. The system is wirelessly controlled via an internet web browser and android apps. It features a camera, gripper, ultrasonic sensor, and GPS module for continuous distance measurement and location tracking. Implemented on a Raspberry Pi 3 with Linux OS, the system is programmed using Python.

GPS BASED SMART SPY SURVEILLANCE ROBOTIC SYSTEM USING RASPBERRY PI FOR SECURITY APPLICATION AND REMOTE SENSING

Robots having cameras that can be controlled remotely and send video footage to the intervention squad are known as spy robots. They are designed to be transportable because they are small and compact. Using PIC 16F628A and PIC 16F877, the project in this paper assumes a moving spy robot controlled by a remote controller. The spy robot is composed of four moveable wheels, an antenna, batteries, and a wireless camera. The two distinct PICs are utilized for controlling a spy robot and a wireless system remotely. A CCD camera is used to record the environment around the robot. On the remote controller, a 4-bit LCD display is installed to view user commands.

This paper presents a remote operated spy robot control system using PIC 16F628A and PIC 16F877. The robot consists of a wireless camera, antenna, batteries, and four wheels. A CCD camera captures information, while a 4 bits LCD display displays user commands. Radio Frequency modules transmit and receive wireless logic signals to control the robot's motors. The robot is designed for spying, surveillance, and inspection purposes, with Brush DC motors and L298N motors used for driving.

DESIGN AND IMPLEMENTATION OF REMOTE OPERATED SPY ROBOT CONTROL SYSTEM

Robots having cameras that can be controlled remotely and send video footage to the intervention squad are known as spy robots. They are designed to be transportable because they are small and compact. Using PIC 16F628A and PIC 16F877, the project in this paper assumes a moving spy robot controlled by a remote controller. The spy robot is composed of four moveable wheels, an antenna, batteries, and a wireless camera. The two distinct PICs are utilized for controlling a spy robot and a wireless system remotely. A CCD camera is used to record the environment around the robot. On the remote controller, a 4-bit LCD display is installed to view user commands. In order to utilize the spy robot at night, the CCD is configured with LEDs.

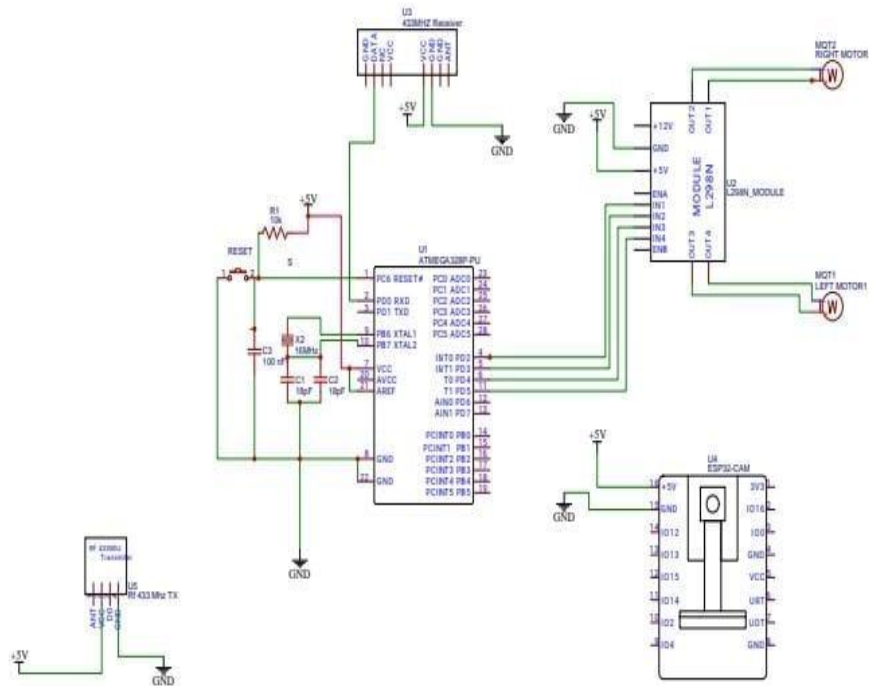
III . METHODOLOGY :

Designing an RF –based surveillance system begins with defining the scope, such as the area to be monitored and the desired coverage . Next , conduct a site survey to understand the RF environment and interference sources and then implementing security measures such as encryption to protect data transmission . Finally , testing and optimization are crucial to ensure the systems functionality and reliability , considering factors like range , data integrity ,and interference mitigation.

KEY COMPONENTS

1. ATMEGA 328 MICROCONTROLLER
2. RF MODULE
3. MOTOR DRIVE
4. DC MOTOR
5. DC LOAD
6. WIRELESS CAMERA

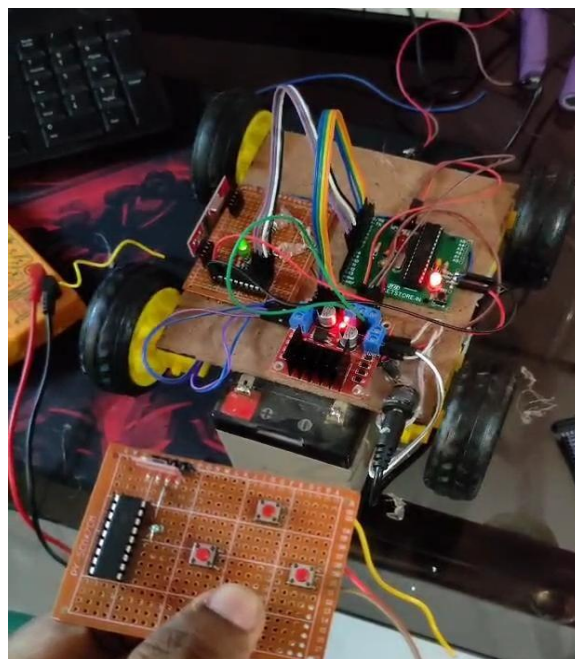
CIRCUIT DIAGRAM :



WORKING :

A RF-based surveillance robot project typically involves the use of radio frequency (RF) communication for controlling the robot remotely and transmitting surveillance data back to the user. The user interacts with the surveillance robot through a control interface, which could be a mobile app, a web interface, or a desktop application. Commands from the user interface are transmitted wirelessly via the RF module to the robot .Upon receiving commands, the microcontroller or single board computer on the robot processes them and control the motors to move the robot accordingly. Commands may include instructions for forward/backward movement, turning left/right, stopping, etc. The captured video is received through internet .When the robot starts working, it generates an IP address which can be connected to any device to see the output. This is because of the inbuilt wifi characteristic of the camera used The surveillance robot is powered by batteries or an external power source. Power management techniques are employed to optimize battery life and ensure uninterrupted operation during surveillance tasks.

IV. WORKING MODEL



V CONCLUSION :

The RF-based Surveillance Robot project powered by Atmega microcontroller embodies a convergence of cutting-edge technologies aimed at revolutionizing traditional surveillance methodologies. By combining the power of robotics, wireless communication, and embedded systems, this project seeks to enhance security measures across various domains, including industrial facilities, public spaces, and residential complexes. Through innovation and ingenuity, we aspire to create a robust, autonomous surveillance solution that ensures safety, security, and peace of mind in an ever-evolving world .

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Author: Anil Kumar Bandani , Dept. of ECE, B V Raju Institute of Technology, Narsapur, Medak, Telangana Anupama Bollampally Dept. of ECE, B V Raju Institute of Technology, Narsapur, Medak, Telangana.

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Authors : Souvik Saha and Arko Singh ,Dept. of Electronics and Comm. Engineering. University of Engineering. & Management Jaipur, India