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REVOLUTIONARY RESCUE UNMANNED VEHICALE

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Project Guide

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Abstract— The monitoring Spy The goal of the robot project is to create a mobile robot that can navigate indoor spaces on its own and carry out a variety of security and surveillance-related duties. Real-time video data transmission, obstacle detection, and remote operator communication should all be possible for the robot. The robot ought to be resilient, stealthy, and situation-and scenario-adaptable. The project intends to show that employing robots for security and surveillance purposes in a variety of fields, including the military, law enforcement, industry, and the home, is both feasible and promising. The primary objective of the suggested system is to offer an economical and efficient solution for missions involving surveillance and reconnaissance.

There are numerous applications for the robot, including journalism, security, intelligence, law enforcement, and the military. The robot can gather important data covertly and enter areas that are hazardous or challenging for people to access. The robot may also sneakily interact with the environment or the victim, and if needed, it can flee or destroy itself. By offering a remote-controlled, safe, and effective way to rescue injured persons, the Revolutionary Rescue Unmanned Vehicle seeks to transform emergency response and wartime situations. Because of its ability to manoeuvre over challenging and dangerous terrain, this autonomous vehicle can remove wounded soldiers from combat areas without endangering other human rescuers. Its sophisticated sensors, cameras, and communication devices allow for accurate mane variability and real-time operator feedback, guaranteeing efficient navigation and prompt rescue operations.

Keywords — SPY Robot, Sensor, Bluetooth, Motor.

I. INTRODUCTION

This project's primary is to construct a mobile vehicle that uses a Raspberry Pi microcontroller. This unmanned vehicle's camera was mounted to control it, capturing and transmitting video to a mobile device. Vehicle motion is managed via a camera and microprocessor. Our plan is to create a robot that can deal with the most difficult situations

that humans cannot handle, such as hostage situations. The persons held as hostages are removed from potentially hazardous situations. Many security and surveillance tasks can be completed by the robotic system more efficiently than by humans.

Today, rapid developments in unmanned aerial vehicles (UAV) sustain highly spatial remote sensing in short spans of time at a low cost. Based on real-time applications, remote monitoring missions such as reconnaissance missions are being deployed increasingly with the strong investment and support of various governments. Past COVID-19 pandemics witnessed the expansion of UAV reconnaissance applications for various mission-critical uses like information dissemination and surveillance, forecasting of temperature in a particular area etc. Most of the manufacturing and radioactive industries are reflecting the fast evolution of such UAVs. The underlying use of UAV in civil engineering to create and estimate the long bridges map in minimum time and cost with aerial surveying particular missions where it drifted in particular surroundings and elongate the mission for an elongated time without degrading the network performances. Present-day UAV design is more complex, dynamic, challenging, and highly competitive with the huge demands of long flight time.

The Revolutionary Rescue Unmanned Ground Vehicle (UGV) is an advanced robotic platform designed to save soldiers in combat zones. Developed to address the pressing need for rapid, autonomous, and safe evacuation of injured or endangered personnel, this UGV represents a significant leap forward in military technology and life-saving innovation. By integrating cutting-edge robotics, AI, and communication systems, the Rescue UGV is capable of autonomous navigation, medical assistance, and extraction in hazardous environments.

The development of the *Revolutionary Rescue Unmanned Ground Vehicle (UGV)* is driven by a critical need to address some of the most urgent challenges faced by military forces and first responders in high-risk environments. In combat zones and disaster areas, the rapid evacuation and care of injured personnel is of paramount importance, but

these efforts often come at great risk. The UGV project is a response to this need, offering innovative solutions that could save lives while minimizing the risks to rescuers and casualties alike. Below are the key reasons why this project is not just necessary, but essential:

1. Minimizing Risk to Human Life

Combat Casualties*: One of the greatest risks faced by military forces is the danger of casualties during combat operations. Injured soldiers often need immediate evacuation, but performing these rescues can expose medical personnel and other soldiers to enemy fire, Improvised Explosive Devices (IEDs), and ambushes. **Unmanned Evacuations:** By deploying a UGV for these operations, the lives of human rescuers are spared, ensuring that no one has to risk their life to save another. The UGV can autonomously enter hazardous zones, locate the injured, and perform evacuations without human presence in the immediate danger zone.

2. Enhancing Rescue Efficiency and Speed

Time Sensitivity: In combat or disaster zones, timely medical intervention is critical for survival. Delays in evacuation or treatment can result in preventable fatalities. **Traditional evacuation methods,** which often rely on human teams or manned vehicles, can be slow and are limited by the threat environment. **Rapid Deployment and Autonomous Navigation:** The Rescue UGV can navigate autonomously through dangerous or difficult terrain, such as urban battlefields, dense forests, or mountainous regions. Its ability to act quickly and autonomously means faster response times, which is essential for maximizing the chances of survival for the injured. **Protecting Medical Personnel Medics in Danger:** On the battlefield, medics are often the first to arrive at the scene of an injury, but they are not immune to enemy fire or other dangers. When a soldier is injured, the medic is often required to risk their own life to administer care and facilitate evacuation. **Reduced Human Risk:** The Rescue UGV can be dispatched to provide immediate assistance in dangerous zones, reducing the number of medics and military personnel exposed to harm.

Surveillance unmanned ground vehicle Eire devices that can perform covert monitoring and reconnaissance tasks in various environments. Existing Systems rely on human operators to control the robots remotely, which limits their Autonomy and efficiency. Proposed systems aim to enhance the intelligence and Adaptability of the robots by using artificial neural networks, computer vision, and wireless communication. These systems can enable the robots to navigate autonomously, detect and track targets, and transmit real-time data to a central server.

II. LITRATURE SURVEY

The Commission work is aimed to present an overview of unmanned aerial vehicles and a representative collection of case studies that show how these systems can be very in several engineering geology activities and environments. UAVs represent a cheap and fast solution for the on-demand acquisition of detailed images of an area of interest and the creation of detailed 3D models and ortho-photo. The use of UAV required a good background of data processing (photogrammetry and structure from motion) and a good drone pilot ability for the management of the flight mission in particular in a complex environment.

These two skills guarantee a good possibility of the acquisition of a good dataset, which should also be correctly planned considering the final engineering geology question that should be solved. The paper cannot be considered an exhaustive document that can be used for the improvement of

these skills if the reader is a beginner, but an introduction to the most important key elements that should be considered by users that are considering the possibility to use UAV in their activities.

If required, the large bibliographic review presented in this paper allows readers to a more detailed analysis of the sequence of actions and procedures that should be adopted to guarantee a correct level of safety and to collect a good dataset that can assure a positive result. As every new instrument, even in the case of UAV, it is important a correct and rigorous approach, because an underestimation of the real level of complexity of these systems could imply clamorous errors in the generation of 3D models that are the base for further study and analysis. A correct approach, on the contrary, creates the right condition for the proper use of these systems and great support in many engineering geology applications.

III. SYSTEM DEVELOPMENT

The main objective of the proposed system is to provide a low cost and effective solution for surveillance and reconnaissance missions. The robot can be used for various purposes such as law enforcement, military, intelligence, security, or journalism. The robot can access places that are difficult or dangerous for humans to reach, and can collect valuable information without being detected. The robot can also interact with the target or the environment in a stealthy manner, and can escape or self-destruct if necessary. The proposed system has several advantages over existing surveillance systems.

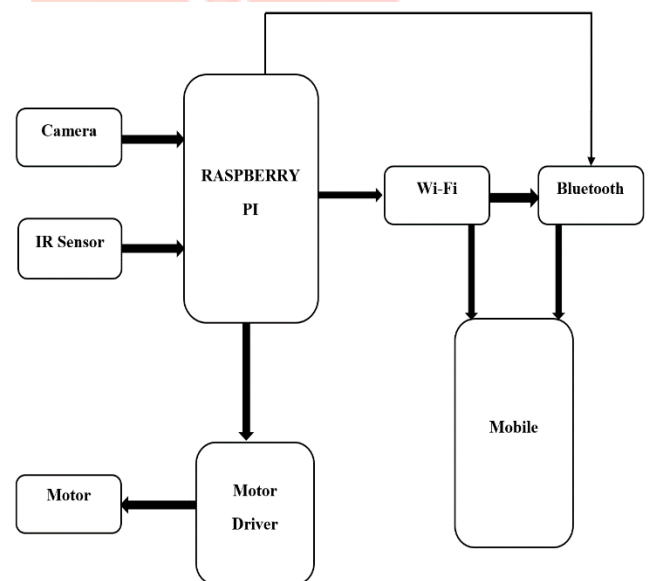


Fig.1 Block Diagram

First, the robot is small and lightweight, which makes it easy to transport and deploy. Second, the robot is agile and adaptable, which enables it to cope with different terrains and obstacles. Third, the robot is versatile and customizable, which allows it to perform various tasks and functions according to the needs of the operator. Fourth, the robot is affordable and scalable, which makes it possible to deploy multiple robots simultaneously or in coordination.

IV. CONCLUSION

In this project, we have designed and implemented a surveillance spy robot using Raspberry Pi as the main controller. The robot can be remotely controlled by a web interface that allows the user to view the live video stream from the camera and send commands to the motors. The robot can also perform autonomous tasks such as obstacle avoidance live streaming. The robot is powered by a rechargeable battery and can communicate with the server via Wi-Fi.

The robot is a low-cost and versatile solution for various applications such as accuracy, exploration, education and entertainment. The Revolutionary Rescue Unmanned Ground Vehicle represents a transformative step in military and humanitarian operations. By combining cutting-edge robotics, artificial intelligence, and medical technology, the UGV provides a powerful tool for saving lives in dangerous situations. Its ability to operate autonomously, navigate complex environments, and deliver critical medical support will significantly enhance the safety and effectiveness of military forces while offering broader applications in disaster response and humanitarian efforts. The Rescue UGV is not just a vehicle, but a lifeline in some of the most perilous situations imaginable.

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