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DEFENCE SURVEILLANCE BASED ROBOT USING AV ARDUINO UNO

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ABSTRACT

This article explains a mobile controlled car which would be a great use for the military. This car helps the Marines by giving an accurate line of sight into areas which are highly dangerous and deadly. In the recent times, there is a need to restructure the defines system of a nation in order to protect its borders from any possible enemy attack. This robot has a lot of benefits; one of them is that the number of lives lost in battlefields will be reduced tremendously. Newer technologies can be implemented in the armed forces by using robots. This article discusses such an implementation of a simple army surveillance robot using Arduino. With more development on these robots, they can also be used to block the communication networks of the enemies using jammers. This article also discusses on such futuristic features which can be added to these robots.

INTRODUCTION

Surveillance is the process of monitoring a situation, an area or a person. This generally occurs in a military scenario where s surveillance of borderlines and enemy territory is essential to a country's safety. Human surveillance is achieved by deploying personnel near sensitive areas in order to constantly monitor for changes. But humans do have their limitations, and deployment in inaccessible places is not always possible. There are also added risks of losing personnel in the event of getting caught by the enemy. With advances in technology over the years, however, it is possibly to remotely monitor areas of importance by using robots in place of humans. Terrestrial and aerial robots can also pick up details that are not obvious to humans. By equipping them with high resolution cameras and various sensors, it is possible to obtain information about the specific area remotely. Satellite communication makes it possible to communicate seamlessly with the robots and obtain real-time audio visual feedback. Thus, in recent times, surveillance technology has become an area of great research interest. However, building a s mall robot for testing and research purposes proves to be extremely expensive. Primarily because a security robot would require certain components such as a GPS module (Global Positioning System), High resolution cameras, radios for satellite connectivity, etc. Each of these components are quite expensive and piecing them together for the purpose of a robot is a very costly and time consuming affair. Moreover, a lot of time is wasted in writing driver code to interface all these components. The solution to this dilemma is quite simple. In the last few years, feature-rich smartphones have become popular. These phones come equipped with the required features such as a GPS module, a high resolution camera. Due to the extremely efficient supply chains that go into manufacturing consumer electronic devices, these phones come quite cheap for the features that they provide.

SYSTEM DESCRIPTION

Our system consists of a remote computer and a robot. The robot is controlled by a user sitting at the remote computer, over the internet. The robot consists of a smartphone running the Android operating system, an Arduino microcontroller to control the robot's motion, and the requisite hardware (motors, chassis, power supply, etc.)

The user controls the robot by sending control signals to the Android smartphone. The smartphone then forwards these signals to the Arduino Microcontroller, which then moves the robot in the required direction.
The camera on the Android smartphone is used to s end video feedback to the remote user simultaneously over the internet. This enables the user to navigate the robot remotely. Additional processing can be performed on the video feed on the remote computer. A visual representation is shown below.
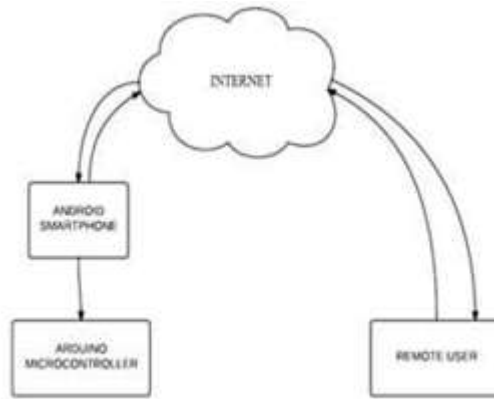
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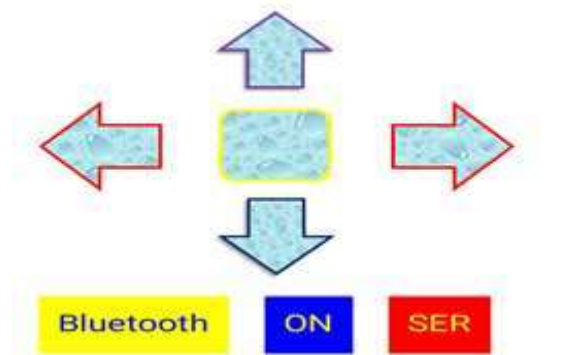

fig1: A basic overview of the system

fig2: Android Application on the Smartphone

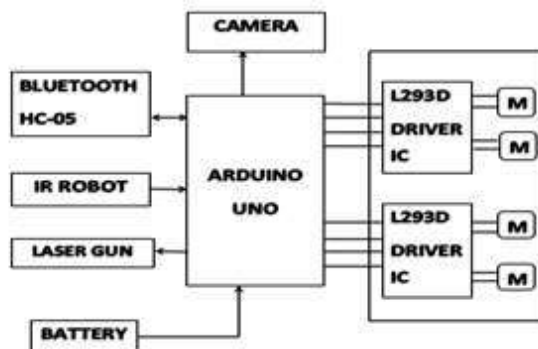*A Basic Block Diagram of the Project is shown below.*

fig3: Block diagram of the Robot

This robot contains Arduino Uno as its brain. Appropriate code is fed into the Arduino and it combines the function of all the parts like the Bluetooth module, infrared sensor, ultrasonic sensor, motors.

The infrared Sensor helps in locating underground mines when its pots one, its ends an information to the Arduino and the military can know the position of the mine and they can easily detonate it without losing lives. The

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Surveillance camera helps the military to find the location of the enemy targets and their intel's which gives the military a good line of sight in the enemy region.
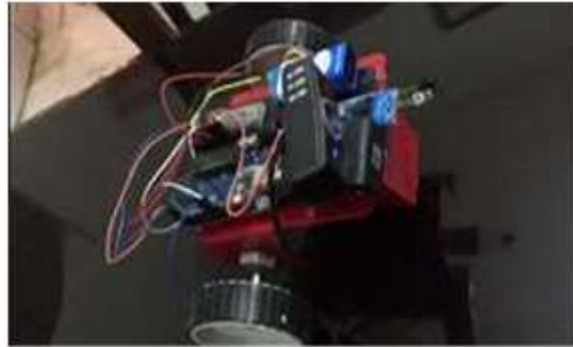

fig4: A picture of the robot, with the Arduino on top

APPLICATIONS

There are many applications of Surveillance Robots that would serve military; one of them is that it can be used for transportation to search & rescue and attack. In military services, there are some areas in which some of the tasks involve greater risk and danger, and therefore, those tasks must be performed without military personnel, solely by the robots. Nowadays, with the development of technology, several robots with very special integrated systems are particularly employed for such risky jobs to do the work diligently and precisely. Another application would be the development of Pick-N- place robotic arm and movement controlled by android wirelessly. This military robot can safely handle bombs especially while catching them and avoids the danger of explosion or extra pressure on suspected object. It is equipped with a soft catching gripper for pick and place function. The remote operation is achieved by a Bluetooth modem via an Android phone based GUI application.

These Robots could be used for mine clearance and IED (improvised Explosive devices). Mine clearance is a hazardous machine that can take Human Life. Military Robots for mine clearance are used all around the World nowadays.

The Robots can be camouflaged so that they cannot be seen by the enemies and they can also have made to self-Destruct if they ever get into the hands of the enemies. The robots could be given Night vision which enables them to see definitely at night. They also provide line of sight to the military so that they can identify the number of enemies in the particular area and can plan their mission accordingly. These robots cannot be geared by enemies and Thus, they are used for stealth operations, which will give The military, an upper hand, over enemy terrorists .

fig5: A surveillance Robot

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