A REVIEW PAPER ON DESIGN AND ANALYSIS OF SURVEILLANCE ROBOT

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ABSTRACT

The main objective behind this paper is to develop a robot for surveillance in industrial & war areas. The project is designed to develop a robotic vehicle using android mobile. For remote operation attached with wireless camera for monitoring purpose. The robot along with camera wirelessly transmit real time video with low light vision capabilities. This is kind of robot will be helpful for spying purpose in war fields. The wi-fi technology is relatively new as compared to other technologies and there is huge potential of its growth and practical application. The security system then acts on these command and responds to the user. The ESP 32 camera is attached with security system for remote surveillance. This kind of robot will be controlled by a human operator, sometimes from a great distance.

1. INTRODUCTION

Surveillance is a real time collection and analysis of data that is timely distributes the information to the operator. Surveillance in Defense Applications plays an important role for keeping an eye out in order to protect its citizens and take necessary actions. Surveillance is the task of monitoring the set of conditions. This generally occurs in a military scenario where surveillance war areas, adversary territory. Human surveillance is carried by experienced work forces in close sensitive areas so as to continually monitor for changes. Whereas there is always added risks of losing work force in the time of getting caught by the adversary. With advanced technology in pasted years, there it is possibility to monitor areas of importance remotely by the use of robots instead of human. Apart from the given advantages of not losing any work forces, physical and elegant robots can be used detect subtle elements that are not conspicuous to people..A surveillance robot is a partially automated machine that works as per instructed by operator and move to destination , Streaming video or pictures which can then analyzed by the operator. Surveillance is a crucial task, we cannot put someone life to risk, instead of that we can use this kind of robots which do not need sleep, they don't get hungry, they don't have emotions, they are just stick to their duties and follow the orders. Nothing can be more important than human life. Use of such robots can help to save many lives on border areas. And we can use this manpower in other tasks. Here we use an android device to control the robot. Connection is established to the micro-controller using wifi . The base part of robot consist of wheels, so they can travel on rough & watery surfaces also. So the one who is sitting on the output screen can have all the records of opponent activities. This kind of robots can easily replace the soldiers and industrial workers where human access is impossible at that time this robot perform their duty with better modifications. So in the future the warfare are handled by this kind of smart robots. Which minimize the life threats during wars. And in future instead of security guards we will use this kind of robots.

2. METHODOLOGY

In this project, we are using a Servo motor,ESP-32 camera module, L298N motor drive module, Battery to build this surveillance robot . The ESP-32 camera which we used over wifi and internet provides us a live feedback. The amazing part is here that, we can control the whole setup from an android device. By using this data, the user gives further commands to the robot.The robot has 4 main controls forward, backward, turn left, turn right. The datacaptured through camera module is sent to the operating device. The speciality about this camera is that it can capture anything from bottom to top.

3. LITERATURE REVIEW

Robotics research today is focused on developing systems that exhibit modularity, flexibility, redundancy, faulttolerance, a general and extensible software environment and seamless connectivity to other machines. Some researchers focus on completely automating a manufacturing process or a task, by providing sensorbased intelligence to the robot arm, while others try to solidify the analytical foundations on which many of the basic concepts in robotics are built. In this highly developing society time and man power are critical constrains for completion of task in large scales. The automation is playing important role to save human efforts in most of the regular and frequently carried works. The main idea to construct this robot is for the spying purposes, it for to keep an eye on people maneuvers in the battle ground or in the industries to monitor the area where humans cant enter.Army people or entities have to face many dangers on their lives while spying on enemy or opposite entities. To overcome these ideas for this job robot will be more suitable and will decrease the risks of loss of human lives and can better spy illicit maneuvers of their opposite entities. Before entering to any doubtful districts we can send robot to check the status of that field so the

military or army individuals don't need to risk their life. Novandri et.al. (2018) Presented the design and implementation of a surveillance robot that has self protection capability by using nail guns. Also, this robot can transmit audio and visual data using Wi-Fi protocol [1]. Shantanu et al. explained the design and implementation of a wireless robot. This robot is controlled by the internet and it uses the PIR sensors for detecting the living bodies. Also, the robot is equipped with a camera which is controlled through a web page [2]. Chinmay et.al.(2010) proposed a surveillance robot using Arduino Uno microcontroller and a Smartphone.

The proposed system. consists of a video camera, GPS module, and GSM radios. The Robot can be controlled by using PC through the internet. The Microcontroller receives a real-time video from the camera that attached to a stepper motor. This video can be enhanced on the PC by using intelligent image processing [3].

Shoeb et.al. (2015) Introduced the design and implementation an application for the mobile devices using Android OS. This application controls the microcontroller board by using wireless Bluetooth technology. The microcontroller drives a camera installed on the robot to transmit the real-time video [4]. Ashish et. al. Suggested an approach for controlling a surveillance wireless robot using an Android application. The application provides video screen and buttons to control the robot. The Smartphone and Raspberry PI board are connected together through Wi-Fi. This type of robot used in various applications such as traffic monitoring [8].

S. Witwicki et.al(2016) has done a model of surveillance robot autonomously. This can do the activities of surveillance in real time based on uncertain conditions and it also serves as decision making to a robotic problem in research platform. Tarunpreet Kaur et.al have done a wireless robot for military application.In this, the robot can be operated using Dual Tone Multi Frequency, which can be controlled by mobile and the range has maximum level to operate the robot [4].

Aditya prakash, Rahee walambe et al (2018) described about a simple military surveillance robot with the commands for moving front, back, right, left and stop are being received from the remote controller and accordingly the input is fed to the Raspberry pi 3 which makes the robot setup respond as per the instructions given. The Kinect sensor works like a camera with an additional feature of depth measurement [4]. Swapnil Bagwari et al (2018) presented a MASS(military assistance and surveillance system) that uses different type of sensor to monitor the soldier such as their location, health conditions, surroundings, sending data to base station, etc. being a wearable device it monitors the pulse rate as well as send the respective data to the base station and by using GPS module the location can also be monitored by military base station. Since it is wearable installation will be cost effective and will add a heavy pack load for soldier [5].

Widodo Budiharto et al (2014) designed a Tracked Robot with Remote Control for Surveillance, the performance of the robot is in terms of the distance and the capability to deliver video streaming from the output raspberry pi and

2.4 GHz Video transmitter. Experimental results with various distanceshow that the best distance for transmitting the commands not more than 20 meters. The average speed raspberry pi to display a video streaming is 33 fps that sufficient for surveillance. The main weakness of type of ultrasonic sensor is the interference between different sensors and the limited ability to identify the obstacle page [5].

4. CONCLUSION

In this project, we made the surveillance robot used in war areas & industrial areas. In this project we design webpage to control the robot. our robot is small in size & light in weight so it is easy to operate into area where human access is impossible & this kind of robot also saves humans lives. We use wifi technology which capture live image & immidiately send to the organization by using ESP32 camera.

5. REFERENCES

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