

Design and Implementation of Robot Motion with IR Wireless Camera [Review]

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Abstract - This paper present the design and development of robot which are specifically used in war field. For that purpose a wireless camera are mounted on the robotic body. This wireless camera is used to monitor the exact position of the enemies and send it on real time base. The robotic motion is control by RF technology. This RF technology can act as a remote control. The transmitter is used to send commands to the receiver where wireless camera is mounted on the robot. The commands include the controlling position of the robot like forward, reverse, left, right, move and stop. These commands are sending by using push buttons. Whatever commands are send to the receiver the robot can act itself. At the receiver there are three sensors are used. These are gas sensor, metal detector and ultrasonic motion sensor. The gas sensors are used to detect poisonous gas spread at war ground. Metal detectors are used to detect bomb which implanting at war field and ultrasonic motion detector are used to detect object which are coming towards it.

Keyword: RF technology, IR wireless camera, Sensors.

I. INTRODUCTION

As an Indian we never forget 26/11 where most of people have lost their life. As a study we found that lack of planning is one of the major reasons for such loss of lives. Since there were no any devices such as camera for monitoring the right position of terrorist. So it is necessary to make a robot to face such type of situation. Previously a work has been carried out on the robot that can be used in war field with wireless camera present. At war ground a soldier cant directly enter at enemies location. It might be risk on his life. War field has recognized that the automatic devices such like camera is more efficient than the use of human army or human soldier. If we are use automatic devices then there is beneficial part to carry weapons along with such devices. The use of such type of robot to do risky jobs at war field make easy to Indian soldier and secure their life.

In this paper, the work system is divided in two ways one is transmitter and another is receiver. At the transmitter section the commands are transferred via push buttons to the receiver. The commands are said to be forward, reverse, left, right and stop. according to this commands, the robot will take action. For transmitting signal from one end to another RF technology is used. The adequate range for transferring wireless signal from one point to another is about 200 meters. The signal is wirelessly sending via transmitting antenna.

At the receiver section, there are two motors are interfaced along with microcontroller. The motions of motors are capable for moving the robotic vehicle. In this system robot are act as a vehicle. The wireless camera is mounted on the robotic vehicle body. The novelty of this paper is that the wireless camera is capturing pictures in dark night vision. So this robot is very effectively work for spying in war field. This night vision camera is known as IR (Infrared) wireless camera. The IR (Infrared) camera emits light which are not visible to human eye. At the receiver section there are three sensors are

used. They are gas sensor, metal detector and ultrasonic motion sensor. In war field so much poisonous gases are leaked so for detecting poisonous gases, gas sensor are used. Metal detectors are used to detect bomb which implanting at war ground. Ultrasonic motion sensors are used to sense object coming towards it. The robot work on two modes:

- Automatic mode
- Manual mode

In automatic mode, the robot work automatically without human intermission. Whenever any obstacle is detected then robot automatic changes its path. In manual mode with the help of human guidance robot work efficiently.

II. LITERATURE SURVEY:

Complete autonomous robot which can perform varieties of tasks is still under development. Therefore researches all over the world work towards the design and development of such robot, so as to simplify our works in various fields.

Dr. M. Meenakshi[8] presents a paper which include validation of vision based autonomous robotic system for military application. Sum of Absolute Difference (SAD) algorithm is used. This paper verifies the implementation of proposed image processing algorithm on the basis of image subtraction. The developed algorithm is validated in real time by change based moving object detection method [8]. So this type of work is effectively take main role in the application of detection of mines in the war field. This autonomous robot present a novel vision based technique for obstacle identification and path planning on the principle of image processing algorithm. Whatever images are clicked by wireless camera are undergoing the process using Sum of Absolute Difference (SAD) algorithm and then obstacle are identified.

Author Swetha N.[6] presents a paper that proposes

a model of a robot based on “Human Interface Device” utilizing hand gesture. This hand gesture used to communicate along with embedded system for tracking of enemies at war ground. The input of embedded system is 3-axis accelerometer is selected for the seek of capturing the human arm behaviors. The 3-axis accelerometers offer the possibility to control a robot via wireless camera. The 3-axis accelerometer offer to control system with the help of zigbee communication. This work system so much easy that a non-perfect robot programmer can also control robot fluently in easier way. This paper include zigbee network technology is preferable for long distance communication. This paper consists of LCD display which displays the voltage value at y-axis and x-axis. If the 3-axis accelerometer move to any one of the direction and if obstacle are near about it then the LCD Displays the distance measuring from the obstacle and direction of the robot. The speed of robot also control by 3-axis accelerometer. In this work system two microcontroller are used .one is act as an master at transmitter end and another can act as an slave at receiving end. The master microcontroller is sending the signal to the slave microcontroller from one point to another. Whatever signal are transmitting from one end to another this are execute by using slave microcontroller and according that action or movement are carry out by robot.

Ankita patel[7] invents a paper on the basis of touch screen which control multifunctional spy robot. For the seek of long distance communication zigbee network is used. This work system include microcontroller for collecting data from various places and accordingly movement of robot it can control the direction of robot. This paper consists of geared motors which include two wheels attached to it. The motor is started with the help of relay and going to control touch screen. The signal is send from touch screen to be executed by microcontroller at receiver section. It includes component like gripper, camera, video screen and sensors. The methodology of this paper is divided into two sections. Hardware and software implementation. At hardware development various component are uses such as touch screen sensor, zigbee, LCD, intelligent robot. In software implementation microcontroller is prefer. A microcontroller having ability to use large amount of memories such as RAM, ROM. also it having own ports i.e I/O port, timer. All this embeded on a single chip. At hardware section touch screen, tuner card, antenna, zigbee technology are used. At programming section USART communication, analog to digital convert programming and LCD character module programming are prefer. All of this programming are done in C language Programming are preferred.

Purna Jain has design a paper on the base of RF technology used for spying in war field. The new innovation added here that is colour sensor. The colour sensor senses the colour according to surrounding environment and changes its colour. So the robot easily changes its colour and because of this feature the enemy can't easily predicted.

Principle of Colour Sensor:

The colour sensor having three primary colour i.e RED, GREEN and BLUE. It senses the surface colour and according to this change its colour that produces shade with combination of three primary colour RGB. The colour sensor check the reflection of colour and produces that much intensity. Then reflected intensity is converted into 8-bit value. So by using colour sensor surface colour observed and change its colour with help of combination of three primary colour i.e RED, GREEN and BLUE etc.so robot having new added property of changing colour.

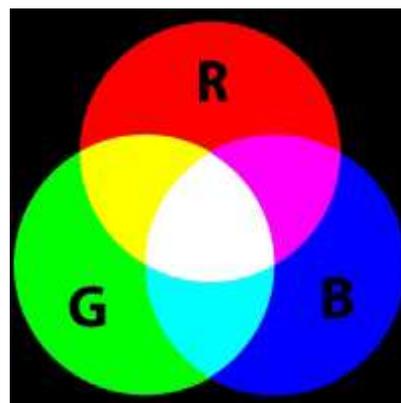


Fig. Colour Identification

The author Dr. Shantanu K. Dixit[10] implement a paper that control robot by remote by using internet. A real time video can be capture by using camera built on the robot. So this type robot is mainly applicable in surveillance. At the user pc, shooting video on web browser. Camera movement can easily directed in vertical and horizontal direction. The robot can be easily move anywhere by DC motor and camera can be directed at vertical and horizontal direction via stepper motor. PIR sensor is used to detect living bodies. The video is processed by RASBERRY PI. The shoot processed video is send by internet so we can control robot wherever we are. But the condition is that we have internet access. If internet access is active then there is no any limitation on range of communication to the user pc with the help of internet.

Dr. S. Bhargavi[1] research of an intelligent combat robot is designed specifically for war field. A protection is provided from enemies. Whenever enemies are came in front of robot he will going to shoot by using laser gun. This remote operation is provided by user sitting at one place. A wireless camera is mounted on the robot. A real time video is transferred to the user pc and whenever enemy are coming in front of robot then user can shoot enemy by laser gun which is operated remotely.

Author Aishwarya Patil[5] design a paper that consists of haptic robotic arm. The word haptic is nothing but

Science of applying sensation of touch and control to interaction along with computer. It gathers information by using speech recognition. After gathering information it going to compare and convert the speech to the text. The graphical user interfaces are attached with the software. the module is

provided with a convenient way . The user is authenticated to giving 6-voice commands by speech recognition system. After processing the speech the commands are given to the robotic system for further action. In this paper hand gesture, voice recognition system and morphin method are used.

Dhiraj Singh Patel[3] design papers that represent a robot operated by mobile. It having camera that spy every movement of enemy and control by mobile. So it is mainly applicable in military field and also preferable for police. The DTMF (Dual Tone Multi Frequency) technology is used. Because of this technology robot is control by using mobile and range of communication is unlimited. But the mobile network should be efficient. In this paper work the mobile is attached with the robot and another mobile having user trainer. The robot is completely hadle or control by mobile. For processing , initially mobile user make a call to another mobile which is attached with robot. Due to calling if a key is pressed a tone corresponding to the key pressed is heard at the other end known as DUAL TONE MULTIPLE FREQUENCY (DTMF).[3]Then the robot will receive tone with the help of phone stacked in the robot. At the other end the tone is processed by microcontroller by using DTMF decoder. This send command to the motor driver ic which drive robot forward, reverse, left and right.

Ankita Patel	Touch Screen Controlled Multipurpose Spy Robot Using Zigbee	Zigbee technology
Prerna Jain	RF Based Spy Robot	Controlled By hand held Tx
Dr.Shantanu K. Dixit	Design and Implementation of e-survellian robot for video Monitoring & Living Body	PIR sensor used to detect living Body
Dr.S. Bhrgavi	Intelligent Combat Robot	Security is provided by laser gun
Dhiraj Singh	Mobile Operated Spy Robot	DTMF Technology

III. COMPARATIVE STUDY

A. IMAGE PROCESSING:

As seen in literature survey various methodologies are used in robotics to give an excellent result for spying at war field. In vision based robotic system for military application a robot is design on the principle of image substraction. In which whatever images are capture by camera first compare to predefined image if any movement is occurs then object is detected. Here image processing algorithm is used.

B. HUMAN MACHINE INTERFACING:

A robot is design on the base of human interfacing device. For design and implementation of robot, the human interfacing device principle is used.

Table 1. Comparison between different technology

Author	Title	Technology
Mr. Sandeep Bhat	Vision Based Robotic System for Millitary Application	Principle of Image Substraction
Swetha N.	Design & Implementation of Acclerometer Based motion & Speed control with Obstacle Detection	Based on human Machine Interfacing Device

In that work a general purpose camera is used in which the movements of enemies are capture at day. In war fields we have to continuously monitor the behaviors of enemies during day as well as Night also. So there is highly risk to use general purpose camera in war fields.

In vision Based Robotic System For Military Application-Design and Real Time Validation paper there is no any sensors are used which are essentially take part in war fields for the seck of detection of any poisonous gas ,bomb. so we never predict that whatever implanting in war ground.

Security is the first priority in today’s unsecured life. In all papers we have seen in literature survey that there is no any security provide to the project. so it is very harmful to use in war field.

IV. PROPOSE SYSTEM

This work system presents a novel vision based technique for finding the movements in completely dark area. This proposed system gives an exposure to design a soldier robot that can be used to do multifunction in war field. This proposed design and implementation remote controlled soldier robot by using RF technology will be used to control the robot from certain rang of distance using the RF based wireless communication. To improve our project functions we have added some latest technology infrared wireless camera that capture videos in night vision on real time bases and sensors that sense poisonous gas also detect bomb that implant in war field. The modules we have added in proposed approach are

- IR wireless camera
- RF Technology
- Sensors

The work system was come out with the operation of receiver and transmitter circuit. The RF technology is used for long distance communication. The adequate range for RF technology is about 200 meters. In first module we are using

IR camera that captures the pictures in completely dark area. The second module that is RF module is used to transmit wireless signals from one point to another. The third module is Gas sensor senses poisonous gas that leaks in war field. The fourth module metal detector is used to detect bomb which are implanting in war ground.

V. CONCLUSION:

The advances in new high speed technology which makes growing capacity that provide excellent opportunity in various methods of robot control.

In this paper we have review many papers and according that we propose our system that invent latest technology. In our work system whatever commands are send to the receiver the movements of the robot occurred according to commands. The IR wireless camera is mounted on the body of robot which transmits real time video and captures pictures or moving objects in dark area. So we can say that this work system having dark eye which monitors the video in completely night vision. The robot act as an soldier that enters directly into the enemy area and senses poisonous gas as well as bomb implanting in war field.

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