

Design a Robot with a Wireless Camera using Remote Monitoring System

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Abstract - This work presents design of a robot with wireless camera having night vision capability for remote monitoring system. The night vision camera allows for transmitting real time night vision video even in dark environments and this system is useful in contaminated areas where humans have no possibility to enter during the period of night. The vehicle can be controlled remotely by an android device for easy operations such as making the robot move front, back, left and right directions. The vehicle consists of receivers, this receivers transmit data to controller and the system controls by using microcontrollers. The night vision camera is mounted on a robot and have to collect that data from darkest areas by using visible electromagnetic lighting system.

Keywords - Infrared; Sensor; Electromagnetic; Night vision camera

1. INTRODUCTION

This night vision capability robot consist of a controller which acts as the brain for ease of understand the command. The mechanical parts are motors, pistons, grippers and gears which makes the robot perform various functions like movement, turn and lift. Based on sensors it identifies the required amount of pressure to be applied on the system. This robot can be controlled by controller and is based on microcontroller by giving proper instructions. The night vision camera is used to observe objects and the movement of robot, by using visible electromagnetic lighting system the robot can move to any place and complete the monitoring process. The robot along with wireless camera is to transmit data and give confidential information regarding contaminated areas. The commands are sent to the receiver to control the movement of the robot to move forward, backward, left and right. The night vision wireless camera is attached with the robot in order to monitor the situation and the camera can be rotated 360 degrees through a motor and that will transmit the data in order to prevent damage and loss to the human life. The movement of a robot is also controlled through detecting sensors to avoid the collision. The movement of the robot is wirelessly controlled by a transmitter to send commands to receiver which is mounted on the moving robot.

2. WORKING MECHANISM OF A ROBOT

The wireless infrared camera is used in the robot when there is insufficient visible light. The night vision devices create the images based on difference of surface temperature by detecting infrared heat that emanates from objects and their surrounding environment. The light emitting diodes are positioned around the outer edges of the infrared night

vision security cameras which gives night vision to the cameras. The Wireless Infrared Camera is shown in figure 1 and Interfacing the elements with wireless monitoring system is shown in figure 2. A transformer is a passive electrical device that transfers electrical energy between circuits. A varying current in one coil of the transformer produces a varying magnetic flux, that in turn, induces a varying electromotive force across a second coil wound around the same core. Electrical energy can be transferred between two coils without a metallic connection between the two circuits. The induced voltage effect in any coil due to changing magnetic flux encircled by the coil and a step down transformer is used to reduce the output voltage and to keep it in safer low voltage. There is no electrical connection between the input and the output of the secondary coils and they are connected by an alternative magnetic field which is created in the soft iron core of the transformer. The Rectifiers consist of diodes and they carry out the rectification process that means converting voltage into direct quantity. The microcontroller collect the data from the sensors or the controlling devices such as light, temperature, fire detector, measuring objects, revolving objects and the process control devices. A servomotor is coupled to a rotary and linear actuators and it was coupled to the sensors and are control and collect the feedback of the angular and linear positions of the activating system. A servomotor is a closed loop servomechanism that uses position feedback to control its angular and linear positions and the measured positions of the output is compared with the collaborated command positions after that send the external input data to the controller as it to bring the output shaft to the appropriate position that means the error signal reduces to zero and the motor stops. The transmitter section has an encoder and sensing which provides feedback by converting the electrical signals into codes and it controls the linear and angular moments of the robot.



Figure 1. Wireless Infrared Camera

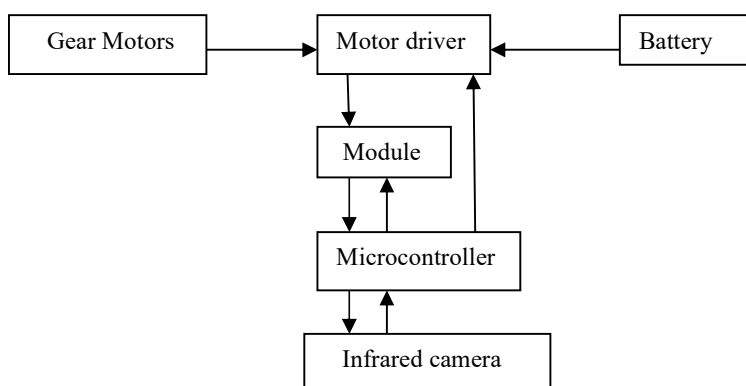


Figure 2. Interfacing the elements with wireless monitoring system

The transmitted data is received by the receiver modules and instructs the microcontroller regarding the instructions provided and it actuates in the direction as given by the end user and the commands are wirelessly transmitted from the smart phone to the robot.

3. CONCLUSIONS

In this work the night vision infrared camera is mounted on a robot and the data that have been collected from darkest areas by using visible electromagnetic infrared lighting system. The robot movements are under followed by the enhanced locomotive light detective and ranging sensors. The process unit is a capable of processing the information from the scanning sensor and controls the linear and angular actuations of the robot. The speed of the movement and the weight carrying capacity of the robot will be improved by considering the infrared sensor which is connected to the inertia measurement unit. The robot selected with night vision wireless camera and allows the transmitting the vision data and the range of vision operation that are have to be minimising the loss of data with the help of an android codes and this robot was operated by using remotely enhanced and is used in rescue system.

4. REFERENCES

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