

DESIGN OF SECURITY ROBOT IN NIGHT VISION USING WIRELESS VIDEO CAMERA AND ULTRASONIC SENSOR

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ABSTRACT

A robot is a mechanical or virtual artificial agent, usually an electro-mechanical machine that is guided by a computer program or electronic circuitry. It is a unique spy robot circuit which can be controlled using a RF remote controller. It can act as a live telecast of audio and video information's from the surroundings and can be sent to a remote station through RF. Moment of camera is also. The maximum range is 100 meters. Another feature included it measure the distance of object at front of robot and also automatically stop robot if its detect distance of object is inside 10cm & data of distance can be also access at remote section unit by send RF signal. RF 2.4GHz ASK transmitter and receiver are used for the remote control which provide serially communication under specific range. The camera has a receiver, which is placed in the remote station. Its output signals are in the form of audio and video. The objective of the paper is to design a unique spy robot circuit which can be controlled by using a remote controller to detect any object or unwanted incident like fire in the night. Thus, our paper can be used as a societal application to identify culprits in the selected area. Further, the advancement of our paper can be established in security systems in defense.

Keyword: - Security Robot, Ultrasonic Sensor, night vision, CMOS sensor.

1. INTRODUCTION

An embedded system can be defined as a computing device that does a specific focused job. Appliances such as the air-conditioner, VCD player, DVD player, printer, fax machine, mobile phone etc. are examples of embedded systems. Embedded systems do a very specific task [2]; they cannot be programmed to do different things. Embedded systems have very limited resources, particularly the memory. Generally, they do not have secondary storage devices such as the CDROM or the floppy disk. Embedded systems have to work against some deadlines. A specific job has to be completed within a specific time. In some embedded systems, called real-time systems, the deadlines are stringent. The application areas are nearly 99 per cent of the processors manufactured end up in embedded systems. The embedded system market is one of the highest growth areas as these systems are used in very market segment- consumer electronics, office automation[6], industrial automation, biomedical engineering, wireless communication, data communication, telecommunications, transportation, military and so on.

1.1 Sub Title-1 Organization of the paper

The paper is organized as follows. Section-1 describes about the introduction of Spy night vision robot with moving wireless video camera. The literature review and the objective is discussed in Section-2. The Design methodology of

the proposed work is illustrated in Section-3. The results are discussed in Section-4. The conclusion and future scope of the work is presented in Section-5. Acknowledgements are give in Section-6. References were cited in section 7.

2. LITERATURE REVIEW

This section discussed about the important contributions in the related field of our paper. A Spy robot is a machine which can be controlled by the remote. The maximum controllable range is 125meters. The remote has four switches to control the robot in four directions. Spy robots are made so small and compact enough to easily transport [1]. One of the major applications of this paper can be analyzed using android based smart phone which can be used to control the movement of the robot. The robot sends the signal to the RF receiver mounted on the robot via RF transmitter at the base station. [9].

The design of our paper encourages developing a robotic vehicle based on RF technology for the remote operation connected with the wireless camera mounted on the robot for monitoring purpose. The robot is embedded with 8051 series microcontroller for desired operation and is generally used for spying purposes [7].

2.1 Objective of the paper

The objective of the paper is to design a unique spy robot circuit which can be controlled by using a remote controller to detect any object or unwanted incident like fire in the night. Thus, our paper can be used as a societal application to identify culprits in the selected area. Further, the advancement of our paper can be established in security systems in defense.

3. DESIGN METHODOLOGY

The software tool used is KEIL μ VISION 4. This program has been termed as "Source code". Before we look at the source code we define the two header files that we have used in the code. Keil development tools for the 8051 Microcontroller Architecture support every level of software developer from the professional applications. Source files are created by the μ Vision IDE and are passed to the C51 Compiler or A51 Macro Assembler. The compiler and assembler process source files and create replaceable object files. The Keil C51 Compiler is a full ANSI implementation of the C programming language that supports all standard features of the C language. In addition, numerous features for direct support of the 8051 architecture have been added.

3.1 Block Diagram

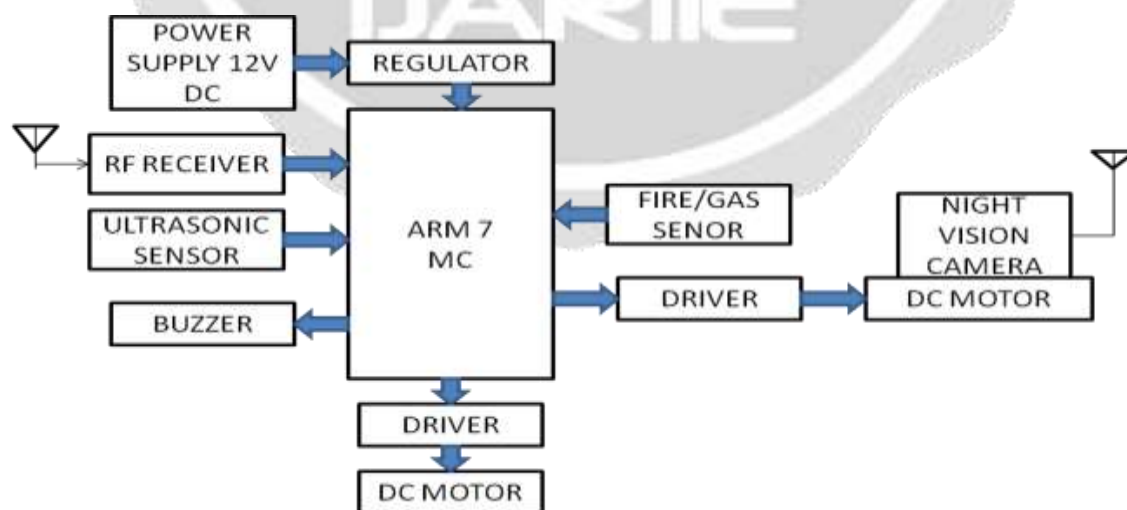


Fig -1: Block diagram of SPY night vision robot with moving wireless video camera

3.2 ARM 7 Microcontroller

The ARM is supported by a toolkit which includes an instruction set emulator for hardware modeling and software testing and benchmarking, an assembler, C and C++ compilers, a linker and a symbolic debugger [12].

3.3 MQ6 Gas Sensor

LPG Gas Sensor Module is designed to detect the presence of a dangerous LPG leak in your Home, car or in a service station, storage tank environment by interfacing with Microcontroller without ADC Channels and programming [7]. The module uses MQ-6 sensor to sense LPG leak. The MQ-6 can detect gas concentrations anywhere from 200 to 10000 ppm.

3.4 RF Tx and Rx Module

This radio frequency (RF) transmission system employs Amplitude Shift Keying (ASK) with transmitter/receiver (Tx/Rx) pair operating at 434 MHz. Here HT12E & HT12D have been used as encoder and decoder respectively. The encoder converts the parallel inputs (from the remote switches) into serial set of signals. These signals are serially transferred through RF to the reception point. The decoder is used after the RF receiver to decode the serial format and retrieve the original signals as outputs. An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves [3].

4. RESULTS

The robot movement is controlled by using remote controller and the information from the surroundings can be sent to a remote station through RF signal by which it act as a live telecast obstacle detector by considering distance measurement also. When the power supply to the system is switched ON the LCD will glow indicating that the system is ready.

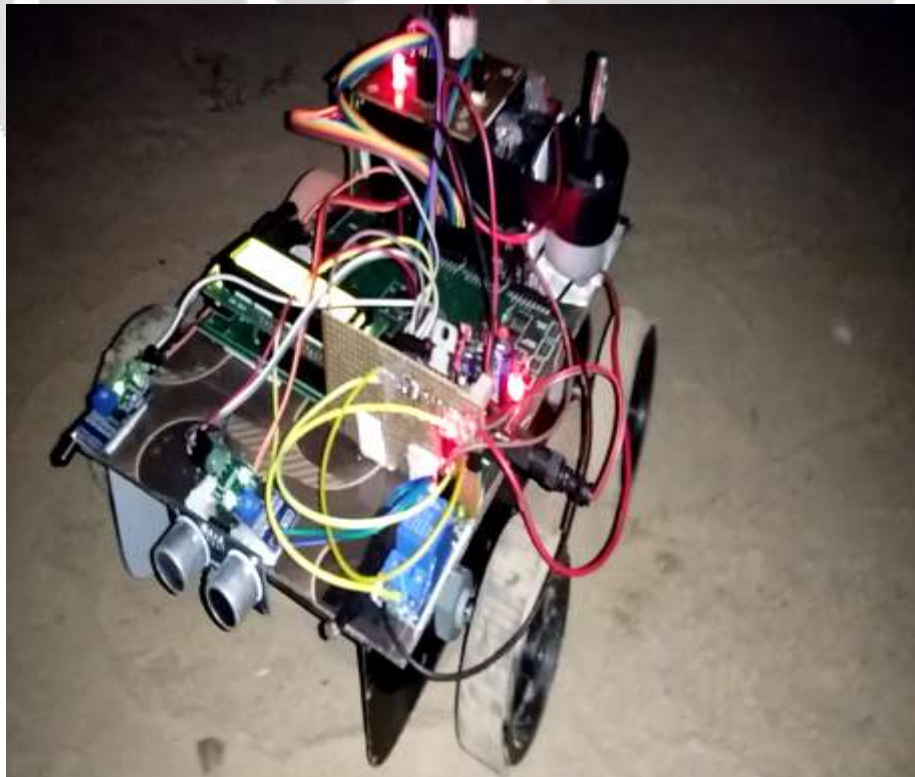


Fig -2: Night Vision Spy Robot

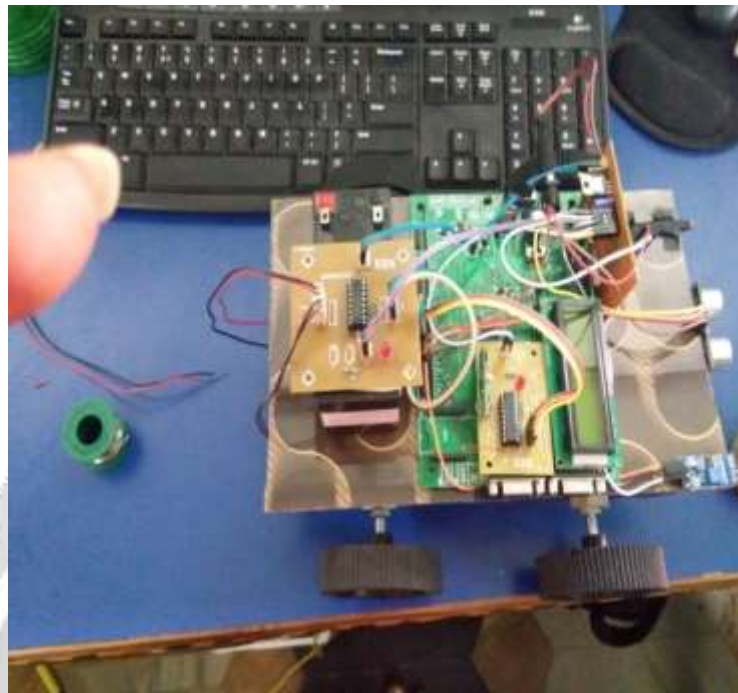


Fig -3(a): Processing Unit Top View



Fig -3(b): Working Model Of the designed kit

By using a RF remote controller we had given instructions to the robot based on the instructions given by us the robot moves. The camera which is placed on the robot shows us the live video of the place the information is sent using RF transmitter. The information is received at receiver side using a tuner card.

5. CONCLUSION AND FUTURE SCOPE

The idea of the paper evolved with a fantasy to see the places we wish to see at will. In this paper, the idea is realized at our fingertips. The paper is done to create a version of spying robot that can enable us to observe the place of our interest. The size of the robot also aids it to be used as a spy robot. Thus to create the robot, we should be able to manipulate its path when necessary. To realize all that, a control unit is required. In this control unit RF signal is used. Using these signals encoding is done and signal is sent through the transmitter. In the receiver end these received signals are decoded and given as input to drive the motor. This will help us to manipulate the robot in the manner we want. A video transmitter mounted on top of the robot helps us to see the path of motion. The reason behind manual control of the robot is that it will not be lost owing to absence of human involvement. Further this paper can be extended for industrial applications also by using different types of sensors.

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