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SECURED SPYING AND SURVEILLANCE SYSTEM FOR BATTLEFIELD MONITORING

John Justin Thangaraj S
Assistant Professor
Department of CSE
Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Chennai

Elakiya K
B.E - CSE
Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Chennai

Hemalatha C
B.E - CSE
Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Chennai

Jayavani K
B.E - CSE
Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Chennai

Abstract - **Recent researchers aim to develop next generation wireless sensor networks for defense industry and homeland security applications. This paper presents a motion activated smart spy robot for military data transmission. The smart dust wireless sensor mote detects and classifies into vehicles, individuals and groups. These motes have a variety of sensors i.e magnetic, acoustic and GPS, a microcontroller for handling these sensor values and a radio transceiver for communication over a wireless network.The robot along with camera can wirelessly transmit real time video with night vision capabilities. This is kind of robot can be helpful for spying purpose in war fields.**

Keywords— **Sensor Networks, Spy Robot, wireless sensor mote**

I. INTRODUCTION

Our nation surveys conventional security system which is quite complex and large.The security system mainly depends on manpower and henceforth it becomes unsecured and inefficient. In critical border areas such as Kashmir and Bangladesh, regular forces or even satellites cannot monitor these intruding terrorists as the area monitored is quite large and quite complex. The present security system faces the following critical issues like:

- No guaranty for human life
- Long distance coverage is not possible
- Need more manpower
- Need time to train as military experts
- Long team process and more expensive

The paper is designed to develop a robotic vehicle using RF technology for remote operation attached with wireless camera for monitoring purpose. At the end I'll use the UART and i2C interfaces in a small RTC project. At the transmitting end using Joystick, commands are sent to the receiver to control the movement of the robot either to move forward, backward and left or right etc. At the receiving end two motors are interfaced to the microcontroller where they are used for the movement of the vehicle. The RF transmitter acts as a RF remote control that has the advantage of adequate range (up to 200 meters) with proper antenna, while the receiver decodes before feeding it to another microcontroller to drive DC motors via motor driver IC for necessary work. A wireless camera is mounted on the robot body for spying purpose even in complete darkness by using infrared lighting.In this proposed design, swarm Robots are used.

II. ROBOT DESIGN PRINCIPLE

A robot is a virtual or mechanical artificial instrument in practice, it is usually an electro-mechanical machine which is guided by computer or electronic programming. The device is thus able to do tasks on its own based on the internal programming logic. Another common characteristic is that by its appearance and movements, a robot often expresses a sense that it has committed or agency of its own. The Robotic Industries Association defines robot as follows: "A robot is a reprogrammable, multifunctional manipulator designed to move material, parts, tools or specialized devices through variable programmed motions for the performance of a variety of tasks."

The main scope is to control the robot device with wireless technology, and hence two separate boards are designed for this purpose.One is transmitter and another is receiver which is placed on the robot. RF technology (wireless communication) is used here for the communication between transmitter and receiver. In the transmitter, the operation like, pressing the joystick, some predefined data will be transferred according to that action through RF communication and the receiver will receive the data. According to the command, the robot will do the specific tasks like FORWARD, BACKWARD, LEFT and RIGHT navigation. And through the wireless camera, the receiver receives the capturedmotion information.

After receiving the command from the controller robot will stop. After some time, the robot will resume functioning on the command and move in the same direction in which previously the robot is moving. For this purpose of issuing commands to the robot, programs in embedded C are designed and embedded.In order to fulfill this application there are few steps that has been performed:

- Designing the power supply for the entire circuitry.
- Selection of microcontroller that suits our application.
- Selection of Robot.
- Selection of DRIVER IC.
- Selection of wireless camera

For the movement of robot, DC motors are used for electro-mechanical functioning. This is operated by a 12Volts DC power supply. In any electric motor, operation is based on simple electromagnetism.
The Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads and switching power transistors. Two bridges are used with each pair of channels equipped with an enable input. A separate supply input is provided for the logic, allowing operation at a lower voltage and internal clamp diodes are included. This device is suitable for use in switching applications at frequencies up to 5 kHz. The L293D is assembled in a 16 lead plastic package which has 4 center pins connected together and used for heat sinking. The chip is designed to control 2 DC motors. There are 2 Input and 2 output pins for each motor. The behavior of motor for various input is shown in Table 1.

Table 1. Behavior of motors

Operation	A	B
stop	Low	Low
clockwise	Low	High
Anti-clockwise	High	Low
stop	High	High

III. SWARM ROBOTICS

Swarm robotics is a field of multi-robotics in which large numbers of robots are coordinated in a distributed and decentralized way. It is based on the use of local rules, and simple robots compared to the complexity of the task to achieve, and inspired by social insects. Large number of simple robots can perform complex tasks in a more efficient way than a single robot, giving robustness and flexibility to the group. An overview of swarm robotics is given, describing its main properties and characteristics and comparing it to general multi-robotic system. The sensors are mounted at the front of each SRV (Swarm Robots Vehicles), enabling it to detect the distance between objects and change direction if they get too close to each another. Here to assist the army and security forces operating in these areas, smart dust like micro-sensors with wireless interfaces could be utilized to study and monitor these environments from a certain distance for military purposes.

Surveillance and Signaling

Imagine an RF transmitter wiggling an electron in one location. This wiggling electron roots a ripple effect, somewhat similar to dropping a pebble in a pond. The effect is an electromagnetic (EM) wave that travels out from the initial location resulting in electrons wiggling in remote locations. An RF receiver can detect this remote electron wiggling. The RF communication system then utilizes this phenomenon by wiggling electrons in a specific pattern to represent information. The receiver can make this same information available at a remote location; communicating with no wires. In most wireless systems, a designer has two overriding constraints: it must operate over a certain distance (range) and transfer a certain amount of information within a time frame (data rate). Then the economics of the system must work out (price) along with acquiring government agency approvals (regulations and licensing).

To keep your design as simple as possible, a 30rpm geared 6v DC motor to the left front wheel have been coupled and another identical motor to the right of front wheel. Both these front motors are mounted side by side by facing in opposite direction. Wheel rims (5cm diameter) along with rubber wheels are directly coupled to each of the motor shafts. This arrangement does not require separate axles.

During forward (or reverse) movement of the vehicle, the two wheel shafts, as viewed from the motor ends, would move in opposite directions (one clockwise and the other anticlockwise). For reversing the direction, you simply have to reverse the DC supply polarity of the two motors driving the respective wheels.

Navigation control

There are different methods available for steering a robotic vehicle. The commonly used ones are:

1. Front wheels are used for steering, while rear wheels are used for driving eg. Tractors.

2. Front wheels are used for steering as well as driving eg, in most light vehicles.

In these vehicles (such as cars), the front wheels are coupledusing a differential gear arrangement. It comes into play only when one wheel needs to rotate differentially with respect to their axes.Here a typical circuit is employed for driving one of the motors, in forward or reverse direction, coupled to, say the left hand front wheel. It means that input terminals of the motor drive circuit for the right hand motor have to be fed with reverse polarity control signals compared to those of the left hand motor drive circuit.

The data is transmitted four times in succession. It consists of differing length of positive going pulses for `1` and `0`, the pulse width for `0` being twice the pulse width of `1`. The frequency of these pulses may lie between 1.5 and 7 kHz depending on the resistor value between OSC1 and OSC2 pins. The internal oscillator frequency of decoder HT12D is 50 times the oscillator frequency HT12E. The values of timing resistors connected between OSC1 and OSC2 pins of HT12E and HT12D, for given supply voltages, can be found out from the graphs given in the datasheet of the respective chips. The resistor values used in the circuits here are chosen for approximately 3 kHz frequency for encoder HT12E and 150 kHz for decoder HT12D at V_{dd} of 5V.

The robot is controlled by means of an RF module, it advantageous when compared to IR transmission in high range accessing.The forward and back movements are controlled by the micro controller. The dc motor is interface with the micro controller, based on the instructions from the micro controller the dc motor acts.The circuitry of robot consists of Stepper motors, actuators, and electrical grips and Pneumatic grippers for pushing and pulling mechanisms and remote control unit, touch sensors, light sensor, collision sensor and micro controller interface for control operations the components used in this prototype model are flexible and cost effective.

IV. Conclusion and Future Application

This paper aims to provide a concept to the security systems which are widely used. The installation in loading vehicles may monitor in carrying the loads in industries. The new and widely used PLC systems are used for autonomous technology.It also used as servant robot by implementing Automatic Guided Vehicle (AGV).It also acts as sample collector and observing the behavior of animals where human beings cannot reach. Implementing nanotechnologyalong with this design will enhance the level of security surveillance systems. The system also focused to generate power for its own operation.

By using voice recognition system we also control the system on commanding in our own voice. On implementing Microprocessor programming, an automatically controlled robot or a vehicle can be implemented in near future. On implementing camera and spy devices we also get the pictures and information during charged suspect. Wireless control devices are gaining enormous applications in robotics and industrial automation applications. By interfacing the voice recognition system we can manipulate the robot based on voice commands; these systems can provide pictorial information using camera and wireless communication module.

V. REFERENCES

1. Thomas Schmickla, HeikoHamanna, Heinz Wrnb, and KarCrailsheima,“Twodifferent approaches to a macroscopic model of a bio-inspired robotic swarm,”, *Robotics and Autonomous Systems*, vol. 57, no. 9, pp.913-921, 2009.

2. Samitha W. Ekanayake and Pubudu N. Pathirana, “Geometric formations in swarm aggregation: An artificial formation force based approach,” *IEEE*

Third International Conference on Information and Automation for Sustainability, pp. 82-87, 2007.

3. Riccardo Poli, James Kennedy, and Tim Blackwell, “Particle swarm optimization”, *Swarm Intelligence*, vol. 1, no. 1, pp. 33-57, 2007.

4. ErolSahin, “Swarm robotics: From sources of inspiration to domains of application”, *Proceedings of the International Conference on Swarm Robotics,Springer Berlin Heidelberg*, pp. 10-20, 2005.

5. Gregory Dudek, Michael R. M. Jenkin, EvangelosMilios, and David Wilkes, “A taxonomy for multi-agent robotics”, *Autonomous Robots*, vol.3, no. 4, pp.375-397, 1996.

6. Riccardo Poli, “Automatic docking and recharging home surveillance robots”, vol. 1, no. 1, pp. 33-57, 2007.