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Survey of Quadcopter Surveillance using LAN

R Arularasu[1], S Deenadhayalan[2], M Hemala[3], S Mila Lucia[4], H Indrapriyadarsini[5]
[1,2,3,4,5]Department of Electronics and Communication Engineering, Karpagam Institute of Technology, Coimbatore, India.

Abstract: *Quadcopter have become popular in many research organizations. Quadcopter is used for finding unusual objects and it can perform their surveillance. Quadcopter is also known as unmanned aerial vehicle. Quadcopter is operated via wifi LAN. The information is transmitted through the"Local Area Network (LAN)". Hence high bit data rate transmission is possible. Quadcopter is used for search and rescue operations, military, news reporting and filming by being able to communicate much faster than normal ones. The video being captured are simultaneously telecasted in the connected computer. The video captured of the surveillance location is monitored. In this Quadcopter machine command is used rather than the human command. In the controller the receiver gets the commands and they perform regarding the command. Quadcopter can be controlled or they can travel automatically using its altitude. Quadcopter is programmed in a way, if the battery attains the critical level, It automatically sense and return back to the origin. The Quadcopter can do their task at any risk places.*

Keywords: *Quadcopter, unmanned aerial vehicle (UAV), wifi LAN.*

INTRODUCTION

Quadcopter is one of the flying robots. The main advantage of the Quadcopter is capable of changing its position due to four wing appearance, which can tolerate wind from any direction. Quadcopter has advantages over the take-off and land-off issues where the aerodynamic design is simple. The Quadcopter specification will also be capable of auto -controlled to fly and reach its specific pre-determined area for surveillance from a pre-planned route around the pre-determined altitude. The Quadcopter control requires human command to control it. Here the command is generated using the computer. The monitoring process is also done through it instead of using separate display. The control of the computer is an easy process as it requires less practice. The quadcopter can be controlled by changing the speed of the rotors and no mechanical peripherals are required to vary the rotor blades. It achieves the command with the help of several sensors like accelerometer and IR sensor. Quadcopter sense the obstacle and moves away from the obstacle. And it moves towards the left then making its motion to fly on its original axis. Since the quadcopter is not damaged by any of the obstacle it's free to fly. The Quadcopter can perform their task without affecting the lives of living beings.

Project Overview

The main goal of the project is to provide the quadcopter which automatically sense and operate by itself. The quadcopter consists of four brushless motors which is highly efficient which can fly more than 500m.It is designed in a aerodynamic propulsion where the propellers attached to the motors that are controlled by ESC (electronic speed controller), the command given to the ESC is done by the arduino. Arduino acts as a main processor which links all the components presented in the quadcopter. The information and the command from the controller side are being transmitted to the quadcopter via (WIFI). The quadcopter consist of WIFI tranceiver which is interfaced with arduino. In order to detect obstacle, four IR sensors is placed in the four wings of the quadcopter.

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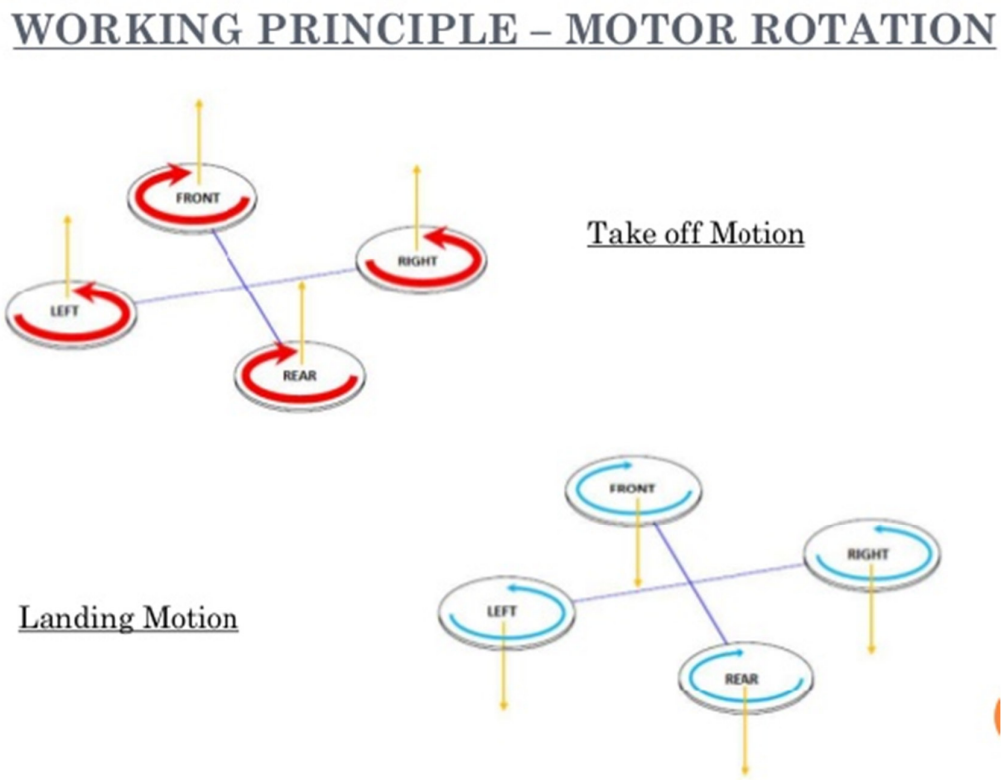

To control the motors of the quadcopter several commands are used. To take off the quadcopter the brushless motors should provide enough thrust. At the receiver side the Wi-Fi router or base station is placed to provide Wi-Fi signal. And the Wi-Fi transceiver from the quadcopter is connected to the router. The coverage area depends upon the signal strength or adhoc network placed. Camera is placed which captures the video and converts analog signal in to digital signal and then transmitted through Wi-Fi transceiver. The quadcopter can find its way by pre-defined altitude and by using accelometer and gyroscope sensor. All the sensors presented in quadcopter are managed and controlled by arduino which acts as main processor. The quadcopter is built in a way which can run without any disturbances even during rainy seasons and in fog. When the quadcopter need to take-off all the four motors should be ON and in landing condition it is vice-versa. To move front motor 1,2,3 should be ON and 3 should be OFF, and to move back motor 1,2,3 should be ON and motor 4 should be OFF. To move right the motors 1,3,4 of the Quadcopter should be ON and 2 should be OFF and to move left motor 2,3,4 should be ON and 1 should be OFF. The algorithm which is used in the ardiuno board to detect obstacle are given below.

Algorithm

```
intIRpin = A0;
intIRemitter = 2;
intambientIR;
intobstacleIR;
int value[10];
int distance;
void setup()

{
Serial.begin(9600);
pinMode(IRemitter,OUTPUT);
digitalWrite(IRemitter,LOW);
pinMode(11,OUTPUT);
}

void loop(){
distance = readIR(5);
Serial.println(distance);
```

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```
}

intreadIR(int times)

{
for(int x=0;x<times;x++)

{
digitalWrite(IRemitter,LOW);
delay(1);
ambientIR = analogRead(IRpin);
digitalWrite(IRemitter,HIGH);
delay(1);
obstacleIR = analogRead(IRpin);
value[x] = ambientIR-obstacleIR;
}
for(int x=0;x<times;x++)

}
return(distance/times);
}
void esc(){
if (distance>1){
if(distance>100){ // continuous sound if the obstacle is too close
digitalWrite(11,HIGH);
}
else
digitalWrite(11,HIGH);
delay(150-distance);
digitalWrite(11,LOW);
 delay(150-distance);
}
else
digitalWrite(11,LOW);
}
```

Conclusion

In civilized countries this project will play an vital role. The main goal of this paper to study the complete design of the quadcopter from the engineering prospective and to improve their balancing, stability and to increase the time level of the battery. The objective of this is to use the quadcopter for the police surveillance and live telecasting of the video obtained to the base station. This will also be able to capture the videos and record it for the filming, managing traffics and other applications. Quadcopter is used in surveillance by live recording the video and provide security for particular areas. The wireless camera is implemented in that quadcopter to record the video and dual antenna is used to transmit the acquired video signal to the control room.

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