IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 5, May 2018

Automatic Fertilizer Spraying Drone

S.Yerte[1], A.Jadhav[2], S.Tambole[3]

BE Student, Dept. of ETC, Sandipani Technical Campus Engineering College, Latur, Maharashtra, India[1,2,3]

Abstract: Unmanned aerial vehicles have become cheaper because many control functions can be implemented in software rather than having to depend on expensive hardware . This even allows multiple UAVs to be used for a single application. In this case, the UAVs must have communication facilities so that they can communicate with each other. This can easily be achieved by equipping an UAV with a wireless mesh node. In this scenario, the UAV swarm can be considered to be a highly mobile wireless mesh network. In this paper we propose an architecture based on unmanned aerial vehicles (UAVs) that can be employed to implement a control loop for agricultural applications where UAVs are responsible for spraying chemicals on crops. The process of applying the chemicals is controlled by means of the feedback from the wireless sensors network deployed at ground level on the crop field. The aim of this solution is to support short delays in the control loop so that the UAV spraying can process the information from the sensors. Further more ,we evaluate an algorithm to adjust the UAV route under changes in the wind (intensity and direction) and the impact related to the number of messages exchanged between the UAV and the WSN. The information retrieved by the WSN allows the UAV to Confine its spraying of chemicals to strictly designated areas. Since there are sudden and frequent changes in environmental conditions the control loop must be able to react as quickly as possible.

Keywords: Arduino board, Bluetooth Model, Brushless Motor.

I.INTRODUCTION

The robot is powerful application in new age development. As per our final year syllabus there is a project, to implement our knowledge in studying previous years. To implement our knowledge according to our engineering field we want to develop such project, that is very helpful to multi application. The applications of our project are as fallows.The quad-copter design was chosen for this project due to its high degree of stability and lifting power. The design consists of a symmetrical array of four motors commonly attached with an 'X' shaped frame. The rotation direction of the motors is alternated, so opposite motors spin in the same direction, to counteract the reaction torques produced by the rotors. This design eliminates the need for a yaw stabilizing rotor commonly used on helicopters. This quad-copter works with Bluetooth controlled network radio based it has 20meter range and we can control the action for quad-copter using the android mobile phones.

II.LITERATURE SURVEY

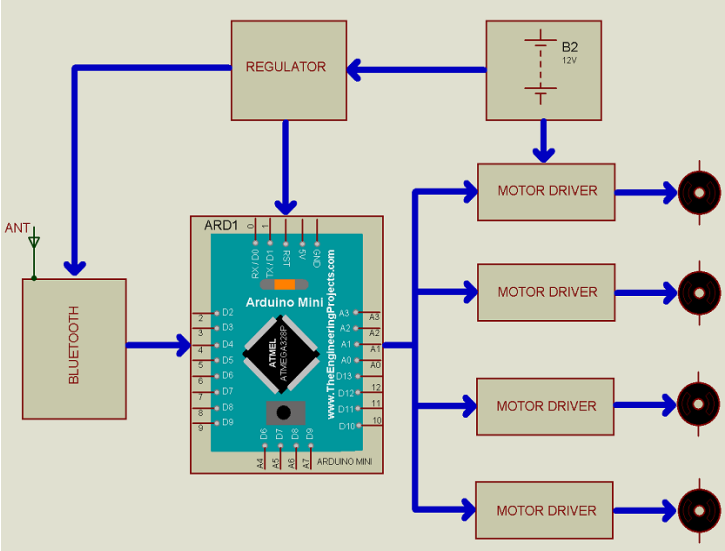
Agricultural biota (e.g. seeds, insects, pollen, plant pathogens, etc) may be transported over long distance. It is important to understand the methods and techniques of airborne that transmit through the air, so as to minimize the propagation of unwanted species in crops that are important for human welfare. The long distance transport of biota takes place primarily in the planetary boundary layer of the atmosphere the layer of atmosphere extending from approximately 50km to 1km above the surface of the earth. Investigator have identified and characterized seeds, and fungi in the PBI. One of the techniques for characterizing specific airborne species is to collect samples at different altitudes under a variety of environmental conditions (e.g. day/night, temperature, humidity, and wind conditions.) One method that enables aerobiological sampling at various altitudes is the use of remotely controlled air craft designed to fly specific patterns and collect aerobiological sampling in the agricultural ecosystem. Agents that cause plant disease are through to travel long distances in the atmosphere and the transport mechanisms are not well understood.

III. SYSTEM ARCHITECTURE

3.1Block Diagram

The following block diagram of Automatic Fertilizer Spraying Drone clearly describing the techniques and modules.

IJARCCE
ISSN (Online) 2278-1021
ISSN (Print) 2319 5940
International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 5, May 2018



3.2 Description of block diagram

Power Supply

Here receiver, motor driver, motor operates with 12V supply and this supply is provided by 12V battery , to charge battery, we required to convert AC230V supply in to 12V by step down transformer and rectifier.

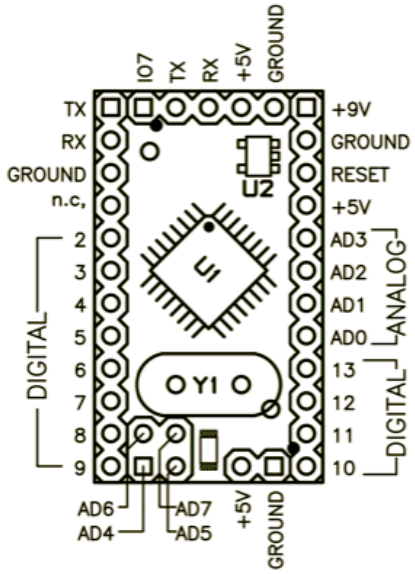
Bluetooth Model

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz[4]) from fixed and mobile devices, and building personal area networks (PANs). We can transmit or receive data in the form of serial communication, with mobile to bluetooth module or microcontroller & bluetooth module with mobile bluetooth also.

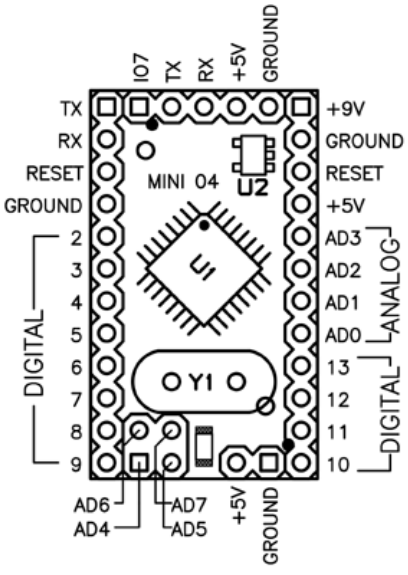
Arduino Mini

Arduino mini gets data from RFRX and control the motor driver using PWM signals.

The microcontroller (an ATmega328) on the Arduino Mini is a physically smaller version of the chip on the USB Arduino boards, with the following small difference:There are two extra analog inputs on the Mini (8 total). Four of these, however, are not connected to the legs that come on the Arduino Mini, requiring you to solder wires to their holes to use them. Two of these unconnected pins are also used by the Wire library (I2C), meaning that its use will require soldering as well. Also, the Arduino Mini is more fragile and easy to break than a regular Arduino board.



Mini 03 pinout (compatible with earlier revisions)



Mini 04 and 05 pinout (the ground on the left has moved down one pin)

IJARCCE
ISSN (Online) 2278-1021
ISSN (Print) 2319 5940
International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 5, May 2018

To use the Arduino Mini, you need to connect:

1. Power

This can be a regulated +5V power source (e.g. from the +5V pin of the Mini USB Adapter or an Arduino NG) connected to the +5V pin of the Arduino Mini. Or, a +9V power source (e.g. a 9 volt battery) connected to the +9V pin of the Arduino Mini.

2. Ground

One of the ground pins on the Arduino Mini must be connected to ground of the power source.

3. Tx/Rx

These pins are used both for uploading new sketches to the board and communicating with a computer or other device.Reset. Whenever this pin is connected to ground, the Arduino Mini resets. You can wire it to a pushbutton, or connect it to +5V to prevent the Arduino Mini from resetting (except when it loses power). If you leave the reset pin unconnected, the Arduino Mini will reset randomly.

4. LED

While not technically necessary, connecting an LED to the Arduino Mini makes it easier to check if it's working. Pin 13 has a 1 KB resistor on it, so you can connect an LED to it directly between it and ground. When using another pin, you will need an external resistor. You have a few options for connecting the board: the Mini USB Adapter, a regular Arduino board, or your own power supply and USB/Serial adapter.

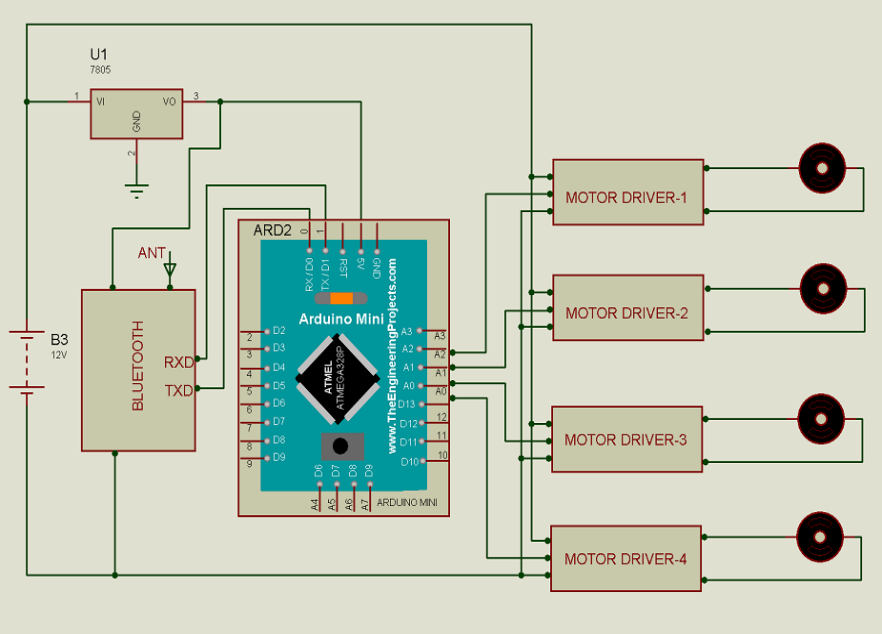
Connecting the Arduino Mini and Mini USB Adapter

The circuit shown here is the basic setup for an Arduino mini connected to a USB-to-serial converter. You can see power and ground from the USB are run to the rails of the breadboard so it's convenient for the other components on the board. The 0.1uF capacitor from the reset pin is connected to the RTS pin on the mini USB adaptor. This enables auto-reset when the serial port is opened, meaning you don't have to press the reset button every time you upload new code. If it gives you problems, you can remove it, and press reset every time.

5. Motor Driver

Receiver unit has limited current output approximately 25mAh for each port it is not sufficient to drive motor directly hence motor driver IC required with its voltage is equal to the motor voltage. Motor speed is depending upon the selection of motors RPM. It should be 20000 to 30000 RPM depending upon our requirement.

3.3 Circuit Diagram



IV. RESULT & DISCUSSION

Thus our group actively with project, and we develop this project named as "**AUTOMATIC FERTILIZER SPRIYING DRONE".**

With the help of mobile application the drone will fly and spread the fertilizer as per the requirement . The purpose of the project is development in Agriculture field.

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 5, May 2018

V. ACKNOWLEDGEMENT

It is our privilege to express our sincerest regards to our project coordinator, **Prof. Sot S.R** .sir for their valuable inputs, able guidance, encouragement, whole-hearted cooperation and constructive criticism throughout the duration of our project. We deeply express our sincere thanks to our Head of Department **Dr Prof. Panchal S.D**. for encouraging and allowing us to present the project on the topic "Sprying Fertilizer Drone "at our department premises for the partial fulfillments of the requirements leading to the award of BE degree. We take this opportunity to thank all our lecturers who have directly or indirectly helped our project. We pay our respects and love to our parents and all other family members and friends for their love and encouragement through out our career. Last but not the least we express our thanks to our friends for their cooperation and support.

REFERENCES

[1] Basic electrical engineering by Kothari and nagrath. Basic electronics engineering by R.S.shedha.
[2] Basic Electrical and Electronics Engineering by R.K. rajput.
[3] Electronic for you by magazine.
[4] www.alldatasheet.com by For Components Data sheet.

.