



Optic Eye in Sky Unmanned Quad Copter for Agriculture Automation

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ABSTRACT:-In this paper we present a multi-purpose agricultural Quad copter to implement precision fertilizer, surveillance growth monitoring and Yield analyzing purpose. This will involve efficient utilization of intensive plant and soil monitoring, condition based use of fertilizers and the ability to work in unstructured environments. In this paper introduce a new image processing technology to comparing the color of unaffected leaves with the affected leaves. The picture of the crop is taken using the camera and pixel of the image color variations is spotted. This taken image then transfers using wireless camera to the central control processing system. If there is any color variation in the leaf like pest affected is calculated using pixel comparison. If variation is detect by the processing system then send a command to quad copter. The Quad copter has a motor with sprayer pump that can spray the minimum level of pesticides over crops to control the pest during the development of crop growth in proper timing.

KEYWORDS: image processing, surveillance, wireless camera

I. INTRODUCTION

The green revolution changed the very technology that was being applied in the Indian agricultural system. It showed great results and made India agriculturally self-sufficient. But these technologies have remained untouched since then and no major improvement has been made to step up productivity to meet the demands of the burgeoning population. The new trend for improvement in agricultural production is that of precision agriculture. Some of the major problems in Indian agriculture are raising input costs, availability of skilled labor, dwindling water resources, over usage of fertilizers and lack of proper crop monitoring. Overcoming some of these problems requires tedious manual work which due to unavailability of enough labor cannot be performed. Hence, one of the solutions could be involving automation technologies in agriculture. Agricultural automation could help farmers single headedly maintain their crops and optimize usage of resources. Here, we present an agricultural quad copter, capable of implementing some of the methods of precision agriculture such as precision pests praying, fertilizer, surveillance growth monitoring and Yield analyzing purpose.

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II. MATERIALS AND METHODS

A) HARDWARE ARCHITECTURE

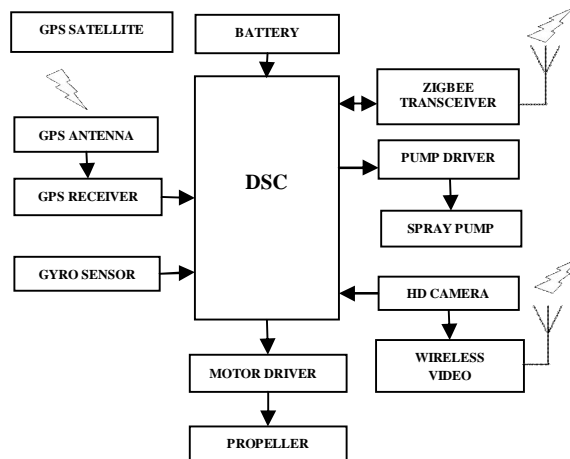


FIG1: BLOCK DIAGRAM

b) DSC Controller

DSCs are utilized as a part of an extensive variety of utilizations, yet the lion's share goes into engine control, power change, and sensor preparing applications. At present DSCs are being advertised as green advances for their capability to lessen power utilization in electric engines and force supplies. In this paper the control medium used to control all the procedure like Sending pictures to process medium and get the resultant after the picture handling. In the event that any of the leaf influenced means then diverse summon will go to the DSC and this will consequently spread the pesticides over plant to control the nuisances.

c) Directional controller:

Here the GPS used to fly the quad copter within the land area. This 64 channel GPS can control the quad copter with in the land by using predefined signals from satellite Longitude, Latitude and Speed it act as a tracker of Quad copter. 2.4 GHz wireless communication with 4 channels is used between Quad copter and Controlling devices. Pest affected leaf or plant identification is done by using wireless HD camera if there is any variation in plant color then the organic pesticide will spray using motor spray pump.



Fig:2 Quad copter Representation

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Fig:3 Topview of the field from Quad copter

III. FRAME WITH 4 BLDC MOTOR

Quad copter Frame with 4 BLDC Motor is used to carry the cameras and sprayer pump, fertilizer to the sky. It flies at the height of 3m range the height of the quad copter is maintained by the ultrasonic transducer. It works on the principle of Using IO trigger for at least 10us high level signal, The Module automatically sends 40 kHz and detect whether there is a pulse signal back. If the signal back, through high level , time of high output IO duration is the time from sending ultrasonic to returning.

IV HD WIRELESS CAMERA

Influenced leaf ID is recognized by catching the picture of the plant utilizing remote camera from the sky if there is any shading change in leaf color and example choose then the signal goes to shower pump and it will splash organic pesticides to the plant.



Fig 4: HD Camera Captured Image



Fig 5: Low Mineral Estimated Area (Blue Marked)

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A Wireless communication

Zigbee/IEEE 802.15.4 is utilized for low information exchange to long separation. In this undertaking remote Camera is utilized to exchange the picture pixels to the portable workstation/android gadget for top of the line advanced image processing. In the wake of finishing of the computerized signal handling the information is send to the quad copter by means of Zigbee handset.

B Experimental Setup

By capturing the image we can identify the crop status. According to that the pesticides are sprayed using the sprayer pump.



Fig 6: High ended image processing result in Laptop/Android devices

IV. CONCLUSION AND FUTURE WORK

Unmanned Quad copter was created to execute the distinguishing the illnesses in the harvest and the developed phases of yields and nourishing it in the ideal time without work. It likewise made the observation for whole day. By this task we can diminishes the reactions to the human amid the compost sustaining and saving the plants. This was tentatively tried in our field and tuned to the greatest exactness result.

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