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Unmanned Seed Sowing Aerial Vehicle

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Abstract: Agricultural drones help the farmers to keep a watch on the fields from the sky. This bird's-eye view can disclose many issues such as irrigation problems, soil variation, and pest and fungal infestations. Multispectral images show a near-infrared view as well as a visual spectrum view. The imaging shows the farmer the differences between healthy and unhealthy plants, a difference that is not always clearly noticeable to the naked eye. Thus, these interpretations can assist in evaluating crop growth and production. Additionally, the drone can survey the crops for the farmer sporadically to their liking. Weekly, daily, or even hourly, pictures can show the variations in the crops over time, thus showing probable "trouble spots". Having identified these trouble spots, the farmer can effort to improve crop management and production.

I. INTRODUCTION

The main objective for developing agricultural automation technology is declining labour force in the farm currently, to overcome this phenomenon making the automatic agricultural machines. Research on agricultural products to work easy in the farm get more output from the farm. The agricultural machinery has more efficient than the previous one also from the man power. Seed sowing procedure in farm is too difficult for labour, so nowadays there are using tractor machinery but for some seeding technique there is no particular solution found. In this case uav vehicle drone will sow the seeds in farm at particular position with less time. The application of agricultural machinery in precision agriculture has experienced a rise in investment and research thanks to the utilization of robotics applications within the machinery design and task executions. Precision autonomous farming is that the operation, guidance, and control of autonomous machines to hold out agricultural tasks. It motivates agricultural robotics. It is expected that, within the near future, autonomous vehicles are going to be at the guts of all precision agriculture applications. The goal of agricultural robotics is quite just the appliance of robotics technologies to agriculture. Currently, most of the automated agricultural vehicles used for weed detection, agrochemical dispersal, terrain levelling, irrigation, etc. are manned. Maintaining the Integrity of the Specifications

II. DRONE MECHANISUM

The drone has various uses depending on the type of application used on the drone. The drone here is used for an agricultural use. The ease of the use of the project is to reduce the time used by the farmers in sowing. The seeds will be dropped by the seeding assembly only when the drone pilot wants to or can be set to be enabled at selected intervals of time.
Using of the seeding drone makes it a point that the seeds are programmed in a way that the seeds drop at a designed set of time. This way it saves time for the farmer by not seeding the seeds individually.

III. TECHNICALITY OF THE DRONE

Hardware in the project the major role is based on the basis of hardware of the proejct. The project is a drone kit which is bought with the compoents present in it. Each componet has its detailed function towards the making of the entier drone .

The following components are as follows:

1) The term UAV is an abbreviation of Unmanned Aerial Vehicle, meaning aerial vehicles which operate without a human pilot. UAVs are commonly used in both the military and police forces in situations where the risk of sending a human piloted aircraft is unacceptable, or the situation makes using a manned aircraft impractical.
2) The Pluto X connects to your smartphone over Wi-Fi and has a range of around 60m. The battery life of the Pluto X is around 12-15 minutes and it charges quickly via a standard mini USB connection (the kind that most smartphones use)
3) *Flight Controller:* The Pluto X has perhaps one of the better drone controller apps we have seen and we don't say that lightly. We had a few initial teething problems connecting to the Wi-Fi (but that was mainly our fault) and support had us up and running in no time.
4) *Camera:* The camera that ships with the tinkerer kit is 720p HD and has a 1MP lens for still shots. The images are fed back to your smartphone via the Pluto X app and can either be stored directly on to your phone (our preference) or on to an SD card that you can insert.

5) *Primus X Specifications:* Primus V4 is flight controller for nano drone Pluto 1.2 which is designed and developed by Drona Aviation Pvt. Ltd. from India. It is re-programmable
6) *Fixed Wing Structure:* Fixed wing drones as the name suggests have two fixed wings along the lateral axis of the aircraft. Fixed wing UAVs consists of a rigid wing that has a predetermined shape (airfoil) which make flight capable by generating lift caused by the UAV's forward airspeed.
7) *Rotary Wing Aircrafts:* Rotor blades work exactly the same way as a fixed wing, however constant aircraft forward movement is not needed to produce airflow over the blades, instead the blades themselves are in constant movement which produce the required airflow over their airfoil to generate lift.
8) Accelerometer
9) Gyro sensor
10) Magnetometer
11) Barometer

A. *Module*

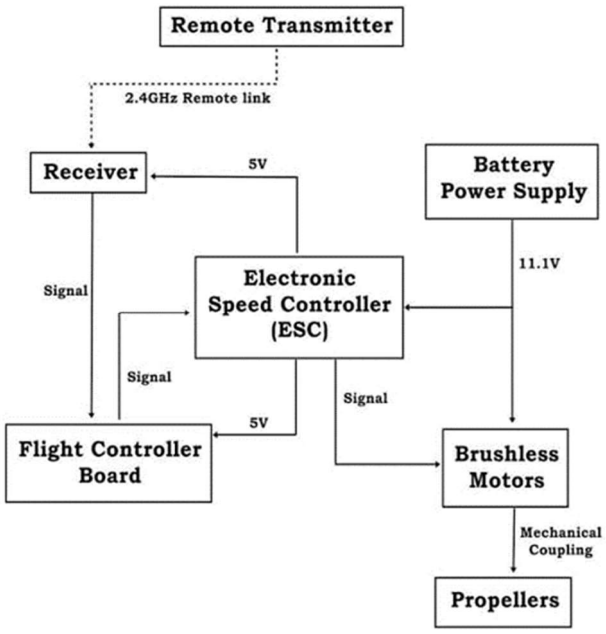
The module plays a very important role in the seeding drone. The module holds the seed which are to be dropped. The module is made of two parts. Part 1- Servo motor. The servo motor is the main movement of action for the seeds dropping. Every time the servo motor moves by a phase shift it moves the module of the seed holder. The seed holder is made of a barrel containing the seeds. with every rotation of the servo motor the seeds will drop out. Part 2 – Barrel

The barrel is the section which has six holes and one shaft. this shaft is then placed in the center of the drone frames so that it holds a uniform distribution of weight on the drone. The Barrel has 7 holes which will holds the seeds. The servo motor has it rotates in every phase shift the seeds fall from the holes.

B. *Programming*

The program used would be done on C+ language as it's easy to interface with the drone board. The aim for programming is to time the Drone to fly at 2m height so that when the seeds are sowed the fall on the ground and not fly off. The programming will be done in such a way that only one seed can be dropped at a same time. At the dropping of the seed the drone will let the seeds fall after a particular designed amount of time. Hence programming plays a very important role for the seed dropping on the field.

IV. BLOCK DIAGRAM



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V. PRESENT STAGE OF DRONE

A. Authors and Affiliations

1.The paper has four authors as the project is done by a group of four students .
2.The paper is divided into four sections for the authors to write their own work part in the paper.
a)Introduction and abstract .
b)Working and purpose of the project . c)Technical specifications .
d) Execution specifications

B. Characteristics of The Drone Seeding Application

Being aware of the various uses of drone seeding projects which are already in exhecusion and are being used world wide. The difference and special Characteristic of our projects is as follows:
The project of seed sowing vehicle is being used on a scale in the agricultural field. Every team brings out different variations in the project for the betterment of the farmers. Our project is an application of the IEEE paper of the Drone seeding project ideas. Our drone seeding drone is not a mass seeding drone. Where the drone would drop seeds on the field without any programed variation in it.
We have programed the drone in a defined path so that there is a neat seeding procedure mainly kept in mind the Indian farmers technique of farming. Once the farmer is done with the field the farmer makes a line of partition for the seeds to be sowed. This drone would fly on a 2-meter height and would show its defined path to the farmer who would be operating the drone. The farmer can control the path of the drone and see where exactly the drone is flying. Once the drone starts flying it drops seeds after every 2 seconds of difference in between the seeding sections made by the farmers. So, the drone fly on a fixed timing and drops the seeds exactly at the timed position for it to drop the seeds.
Compared to the other seed sowing drones these drones are mass seed sowing drones which drop the seeds in an ununiformed manner. These reference drones fly from a height more than 2 m with the seeds dropped from a height and fall is a random position compared to the drone which is programed to be set in the falling of the seeds.

VI. CONCLUSION

This paper will help the farmers for precise seeding and reliable monitoring of the agricultural parameters because physical sowing and testing can consume time and labour. Though the primary expenditure is high there will be no additional cost and maintenance once it gets functional. Further there is no need for manual testing regularly. Therefore, time and energy can be saved. Thus, IoT has reached the farmers for reducing the farming expenditure and ensures growth and health of farmers. This increases productivity and helps in improving the foreign trade and increase the GDP of the nation. Further the drone can be used for taking preventive measures such as monitoring the yield quality and factors affecting it. The Seed sowing aerial vehicle can be automated using internet of things which reduces the energy consumption and labour cost.

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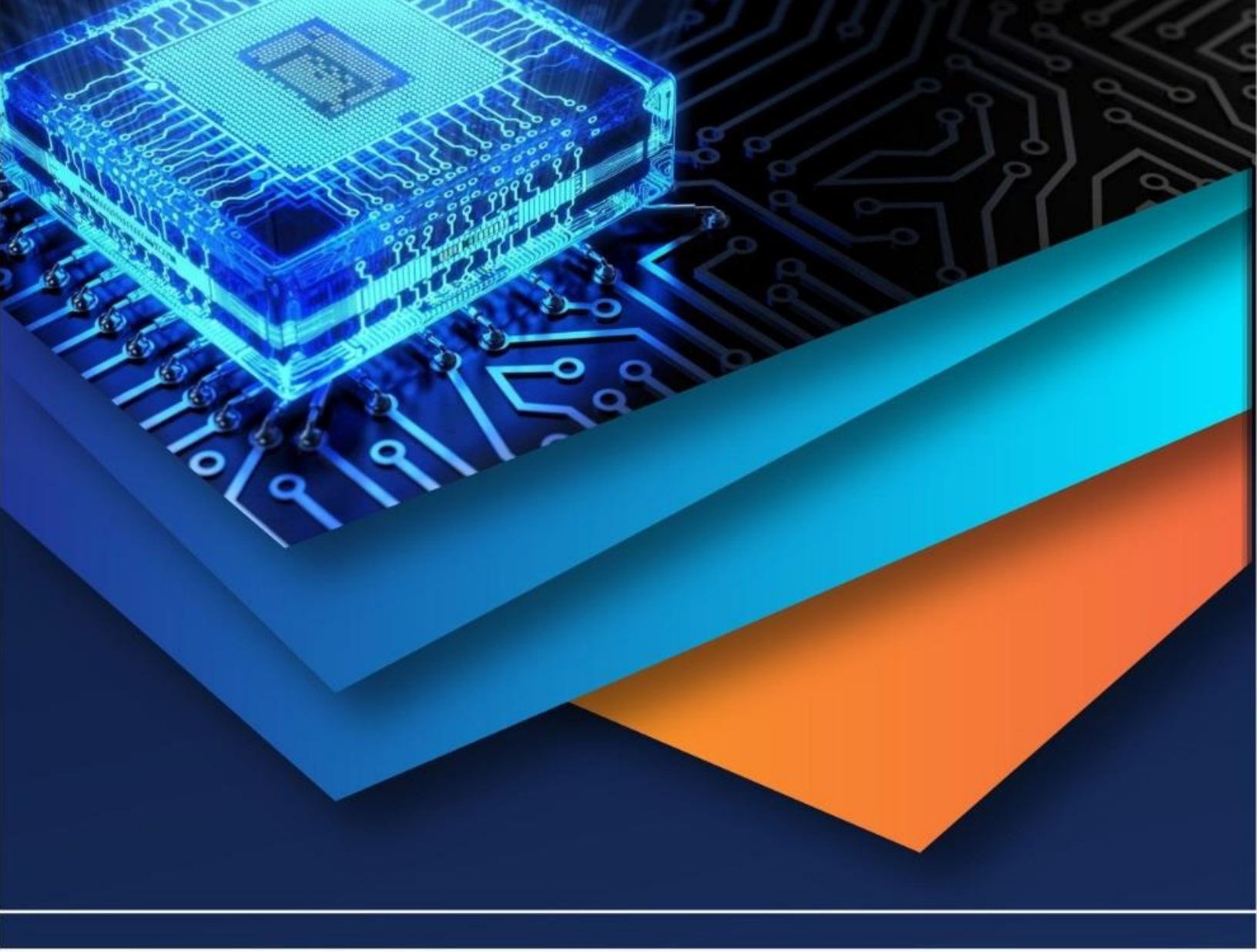

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