

SEED PLANTING ROBOTIC DRONE

¹ Prof.Malini K.V HOD (EEE) ² Prof.Prashantha.K ³Rakshith Kumar Naik KR ⁴Vijay Kumar M G ⁵Manjunatha S

¹²³⁴⁵, Electrical and Electronics Engineering, Bangalore

Abstract: As we all know that forest will be the most important and indispensable source of our country and their benefits are wider, but due to Logging, forest fire and overpopulation, Livestock ranching, to make more land and for housing, Urbanization we are losing an acre and a half of forest every second. so, by keeping these problems we are come up with an idea called tree planting drone, it combined with four technology pans ranging from, IOT, Mechanics, Aerodynamics and fly control system. First, we will take the survey of the land which we are going to plant and after that we plant the by the help of drone, while planting a seed bullet is impitched into the land and after that we will take care of the seeds, Germination etc. by the help of IOT technology. By the help of two operators with ten drones we can plant around 10 thousand plants in one day if the operators and drones increase we can plant around 35 thousand plants in a single day. Now days in rural side the agriculture is lagging because of this reason only. No workers are available for planting, if they available also they will ask more money but the main thing we should understand that is former depends on agriculture. The planting drone has a seed container where the seeds are stored and there is funnel in which seeds are going to drop, the entire planting setup is attached to the bottom of the drone and it can able to carry one to five kg of seeds at a time as per the estimation. so, the planting is easy and time will be saved and to over come from the deforestation we are going to make reforestation by planting the trees because the benefits are more and we are dependent on forest. The seeds container has nutrient solution and is biodegradable and by the help of nutrient solution the seeds starts germinating. so, it's the tool to overcome from the deforesting and make Reforestation and to save the Forest.

Keyword: IOT, Urbanization, Mechanics, Aerodynamics and Fly control system, Biodegradable

1. INTRODUCTION

As much as India depends upon the agriculture, still it is far short from adapting latest technologies in it to get good farm. Developed countries have already started use of UAV's in their precision agriculture, photogrammetry and remote sensing. It is very fast and it could reduce the work load of a farmer. In general, UAVs are equipped with the cameras and sensors for crop monitoring and sprayers for pesticide spraying. In the past, Variety of UAV models running on military and civilian applications. In agriculture, the first UAV model is developed by Yamaha. Unmanned helicopter Yamaha RMAX was introduced for agriculture pest control and crop monitoring applications. However, Yamaha stopped their production in 2007. A technical analysis of UAVs in precision agriculture is to analyze their applicability in agriculture operations like crop monitoring, crop height and planting tree etc.

One of the latest developments is the increase in the use of small, unmanned aerial vehicles (UAVs) or remotely piloted aircraft system, commonly known as drones, for agriculture. Drones (Figure 1), can vary from light, simple, short-range

vehicles, radio controlled in visual line of sight of the operator, to large scale aircraft, tele-operated overseas via satellite link. For instance, the Northrop Grumman "Global Hawk", can fly at altitude over 65,000 feet, equipped with sensors to see through clouds or in total darkness. A wide range of rotary wing platforms is also in use and production, especially mini helicopters for local surveillance or detection. In some cases, drones are able to collect data much more efficiently than either satellites or manned aircraft ever could. The mission depends on the payload and the ground station capacity to collect, process and disseminate data for the mission's objectives. Drones can collect high-resolution images and videos, telephone conversations, intercept electronic communications and any other wave or signal depending on the payload installed on board. They can also recognize faces, or even detect "abnormal behaviors" and identify human targets. Future solar-power drones will be able to stay in the air forever, becoming a continuous surveillance tool in the hand of public authorities. There is no doubt that drones may represent a real threat to the

Methods and Materials

A UAV is an aircraft which can flight without a human pilot and controlled by the radio channel. Multi rotors are the one type of UAVs, further which are classified into number of rotors in their platform. Different types of UAV models are used in last two decades are shown in Table 1. Fixed wing (Fig. 1(a)) UAVs are entirely different in their design compare to multi rotors and

aerodynamic shape of two wings are gives an easy glide of UAV. Single rotor helicopter (Fig. 1(b)) is a model has just one big sized rotor on top and one small sized on the tail of the UAV. Quad copter (Fig. 1(c)), Hexa copter (Fig. 1(d)), Octo copters (Fig. 1(e)) are multi-rotors that is lifted and propelled by four, six, eight rotors

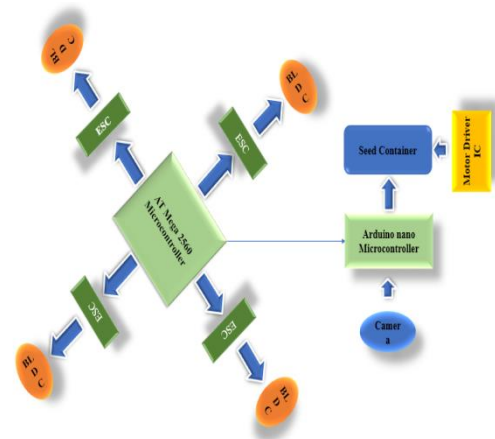
A quad copter, is unique design of UAVs which has four rotors in their model. The lift of quad copter is generated by these rotors. In four rotors, the two opposite rotors are turn in clockwise direction (CW) and the other two turn in counter clockwise direction (CCW).The quad copter movement around the axis

privacyright.Drones are remote controlled aircraft with no human pilot on-board. These have a huge potential in agriculture in supporting evidence-based planning and in spatial data collection. Despite some inherent limitations,these tools and technologies can provide valuable data that can then be used to influence policies and decisions

Methodology:

The flight controller is the main board in the UAV is embedded with the most advanced firmware and responsible for the actual flight. Flight controller controls lot of things simultaneously during the flight

or UAV. It built with a micro controller and communicates to the four brushless motors. BLDC motor connect with the rotors in directions of the UAV configuration model. These BLDC motors are controlled by the Electronic Speed controllers (ESC). The UAV controlled by the Radio channel transmitter and receiver. Ever RC transmitter have number of channels for individual activity to control the UAV. A sample block diagram shown in Fig. 3. Different methodologies, controllers, load and speeds of UAVs



Block Diagram Representation:

Fig :Block Diagram.

Startups have created drone-planting systems that achieve an uptake rate of 75 percent and decrease the planting costs by 85 percent. It is shown in fig.4

These systems shoot pods with seeds and plant nutrients into the soil, providing the plant all the nutrients necessary to sustain life. First, a drone scans the topography to create a 3D map. Then, the most efficient planting pattern for that area is calculated using algorithms. A drone loaded with germinated seeds fires pods into the ground at a rate of one per second, or about 100,000 a day. Scale this up and 60 drone teams could plant 1 billion trees a year

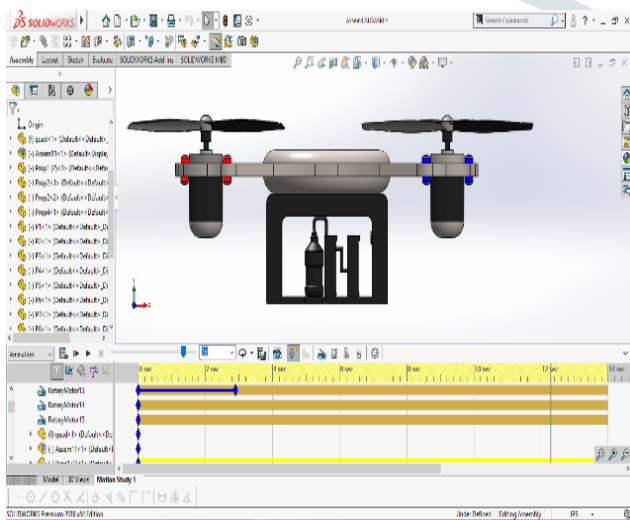


Fig. 2. (a) Quad copter Plus Configuration. (b) Cross configuration.

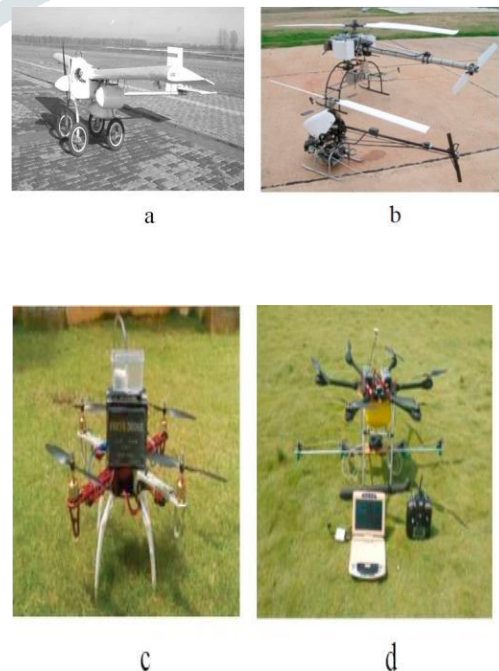
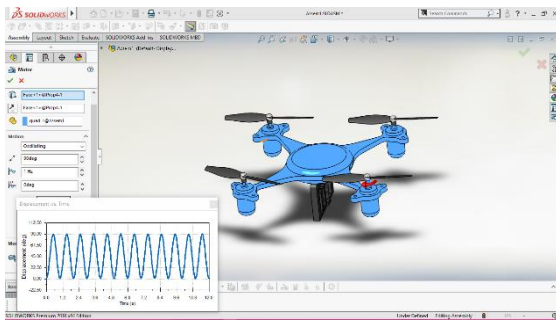




Fig.4 Planting Drone



Applications:

- Reforestation tool
- Crop Monitoring
- Irrigation
- Crop Spraying(Sprinkler)
- Wild Life & Photograph

Conclusion:

The modern farming industry is at a turning point. With the development of more advanced farm management techniques, such as precision agriculture, industry professionals now have more tools than ever to improve the accuracy and efficiency of processes. The use of the different types agricultural drones for solving specific tasks of plant growing is studied: creation of electronic maps of fields, operational monitoring of crop conditions, evaluation of germination and predicting crop yields, checking the quality of ploughing, maintaining environmental monitoring of agricultural land, etc. Consequently, drones are very important tools in the modern agriculture and farming systems.

References:

- [1] Roma, A., 2017. Drones and popularization of space. *Space Policy* 41, 65–67.
- [2] Bell, D., Reinhardt, F., Shelman, M., 2016. *The climate corporation* (Case No. 9-516-060) Harvard Business School Publishing, Brighton, MA.
- [3] Bunge, J. 2015. On the farm: Startups put data in farmers' hands. *The Wall Street Journal*.

August 31, 2015. Available at <https://www.wsj.com/articles/on-the-farm-startups-put-data-infarmers-hands-1441044071>
 [4] Deutsche Wirtschafts Nachrichten, “Monsanto: Die brutalen Herren über das Saatgut der Welt“, <https://deutsche-wirtschafts-nachrichten.de/2016/09/14/monsanto-die-brutalen-herren-ueber-dassaatgut-dieser-welt/>, 25.03. 2017
 [5] Clay Dillow, (2017). “Prospero the Swarming Farmbot Wants to Show You the Future of Agriculture”, 17 March 2018. <http://www.popsci.com/technology/article/2012-06/futureagriculture-swarm-farmbots-can-manage-field-plant-plant>.

