

A REVIEW ON THE APPLICATIONS OF UAVS IN VARIOUS FIELD

Mohit Bajpai¹, Purvansh Singh² and Shambhavi Sinha³

¹Assistant Professor, Poornima Institute of Engineering & Technology, Jaipur, India

^{2,3}Department of Computer Engineering, Poornima Institute of Engineering and Technology, Jaipur (India)

Abstract: Drone is an unmanned Aerial vehicle (UAV), it looks like a helicopter or an aircraft which operates without a pilot through various technologies, and are equipped with high-vision cameras, gyroscope, infrared sensor, GPS, and sensor information for controlling the flight. It was first invented for the purpose of attacking. The development of drone technology has been increased in past 10 years which led to the usage of drones in many outdoor and indoor applications. Still there are many applications to be explored by combining drones with other accessible, adaptable and emerging technologies, for example, cell phones, smart watches, and Internet-of-Things appliances, Artificial intelligence etc. This paper presents the various applications of Advance drone like Forest Mapping, Application to crops, Aerial photography etc.

Keyword- - Drone, Internet of things, Artificial Intelligence, Unmanned Aerial vehicle, Cinematography, Aerial photography.

I. INTRODUCTION

Drone is an autopilot radio controlled aerial vehicle which was invented with the purpose of attacking and used by military of various countries. Later with the development of drone technologies started being used in many other fields. There are various types of drones available based on their classification. It can be understood more easily by Figure1. In current time drone has become a privilege for human beings which is making their lifestyle easy in several ways.

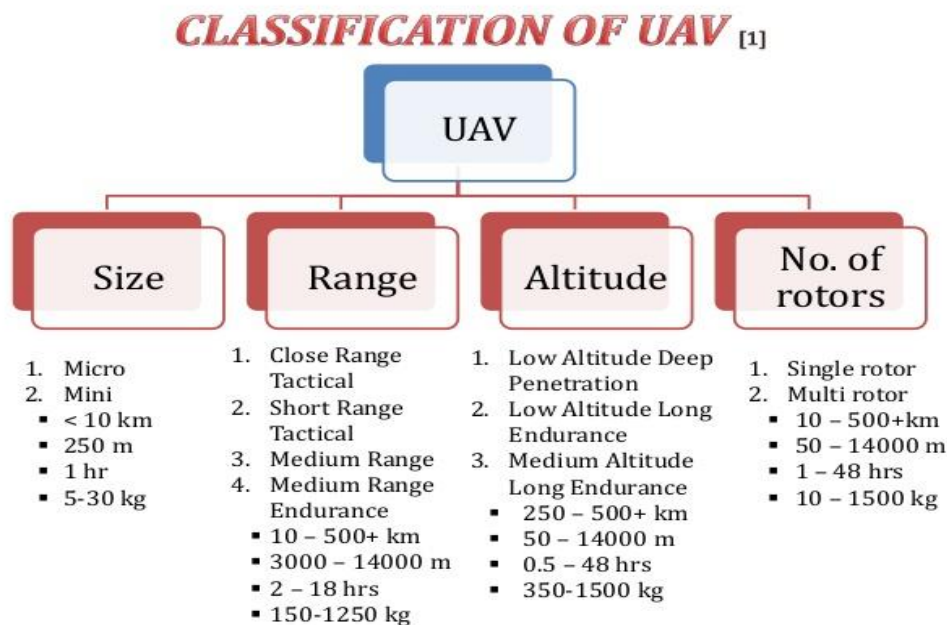


Figure 1 Classification of Unmanned aerial vehicle

II. CURRENT SENARIO

The concept of drone was firstly used by US Army, for the purpose of aerial surveillance. In 1939, United States produced the first remote control aircraft which was known as Radio plane opt. And it continued with the development and modification of drone for wars and other means. In 2014, Amazon initiated the use of drones for delivering packages to customers. These drones were simpler and smaller as that of military drones. Later on, other companies also started developing these flying machines and used for rescue operations, medicine delivery, etc. Facebook also developed a solar powered drone which is used as an atmospheric satellite to provide internet to Remote locations. Currently Drones are used for-

- In Military (Mostly for Surveillance and Offensive Operations).
- In Emergencies and Disaster Managements.
- In Mapping and Surveying of Developing Land.
- In Conservation of Endangered species.
- In Health care (quick delivery of medi kits where ever needed).
- In Agriculture.
- In weather Forecasting.

- In garbage management.
- In Mining.
- In Telecommunications.
- In police patrolling.

These are the various major fields where drone is being used in current scenario.

III. APPLICATIONS OF ADVANCE DRONE

3.1. Defense-

The establishment of drone was started with its use in defense. It is the most significant sector where drones are used. Drones are being used in the military purpose from a long time. Armed drones came into use since 2000 (In figure2).



Figure 2 Armed drone.

They are used for surveillance, targeting, rescuing and many more. Development of technology has taken drone to a next level. Portable and smaller drone are being produced, which are used by military on regular basis for surveillance and offensive operations. Drones are popular for its Army usage. We have seen a recent example of a UAV (Unmanned Aerial Vehicle) shaped like an eagle which was used by Indian Army Intelligence for the surveillance in surgical strike held in 2016.

3.1. Disaster management

As discussed, drones can be equipped with high vision cameras which can provide aerial views of disaster affected areas where human being can't reach physically. It can be used to locate trapped victims. We have seen cases of disasters like earthquake many people die because they can't be located. In these conditions drone can be very useful [1]. Victims can be located easily and can be saved. It can also be used to provide aid to victims. In cases of flood, it is very difficult for rescue team to reach victims immediately. In these conditions, drone act as a boon. It can immediately provide aid and other necessary things to victims. It can also be used for surveillance of affected area (Figure3).



Figure 3 Drones used in disaster management.

3.2. Conservation of endangered species-

For monitoring animals previously helicopters was used. It was used to keep surveillance on elephants, whales, turtles, etc. But it was not a conventional approach and low flying helicopters were dangerous for both humans and animals (Figure4).



Figure 4 Drone used for surveillance of wildlife.

Then after drones were introduced in conservation of endangered species. They operate at around half of the cost of helicopter. It was very easy to use in comparison with helicopters. Six species of sea turtles were considered as endangered species and they were tended to found in open oceans. South University of Alabama are using drones to identify and locate green sea turtles and they have found positive result by using drones. Hence, positive outcomes were founded by taking drones in use for the conservation of endangered species.

3.3. Aerial photography-

The drones are used in a number of ways. It has a vast range in the marketing section. Drones are frequently used in the purpose of aerial photography. In the previous time, different cranes and helicopters were used for the purpose of aerial photography which were very expensive and not all the peoples were able to afford that. So, now drones are being used for this purpose (figure5).



Figure 5 Drones for aerial photography.

3.4. Agriculture-

Production of rich agriculture is actually the base of many countries in the world around. So, it is a must to keep an eye on its health for the better production of crops. Drones can be used in the purpose of agriculture and can be very efficient. In this sector, drone can be used easily in different ways. By the help of drone, data of a field can be gathered very easily by the farmers. It is very helpful for the maximization of efficiency of crops in the field. A farmer can easily detect the problems coming in the field by using the drone. In the drones infrared sensors are tuned by which the deficiency in the crops can be found out. Spraying of medicines through which the insects present are killed in the field areas can be done by using drones. The planting of seeds in the field areas is of the difficult tasks for the farmers. Through the help of drone, distribution of seeds in the field areas can be done very quickly and without any occurrence of problems. It can also be used for the pollination of flowers. In the upcoming years, the uses of drone in agriculture sectors will be increased up to 70% approximately (Figure6).



Figure 6 Drones used in agriculture.

3.5. Waste management-

The management for the waste materials or garbage is very important for any country around the world. By having a proper waste management system, a place can be kept neat and clean. It can also prevent from having several diseases and the people around can have a proper and healthy lifestyle (Figure7).



Figure 7 Drones used for waste management.

Drones can be used for the waste management system by the city administrators for having a better work regarding this. By the help of the drone the waste products or garbage's present can be found out easily and can be picked up by the garbage picking vans of that area. The water bodies can also be kept clean by the use of drones throughout. By the use of the drone, the garbage can be found out near the water bodies and then and it can be picked up by the garbage picking bands of the area. By using the drones for this sector, it has become very easy for performing the task. The uses of drones are rapidly increasing in these areas. Many of the countries in the world like Dubai, China, New Mexico, etc. has already started working with drone for the sector of waste management.

3.6. Mining-

In the vast area of mining, drone can be used. By the help of drone, regular checkups can be done properly in the areas of mining. It can be frequently used for measurement and evaluation of materials. By the help of different focus cameras, drones can be very beneficial for mining purposes. In the areas of mining, it is really very difficult to capture data of ore, minerals and rock storage manually (Figure8).

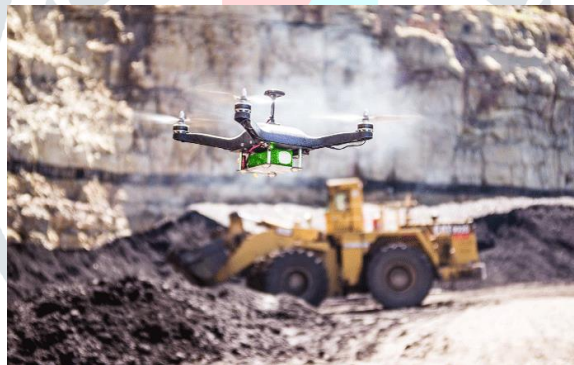


Figure 8 Drones used for mining.

For these measurements, drones with cameras can be used. The acceptance and demand of the Air bionics drone is quite high in mining. It provides a lot of benefits and makes tasks quite easy which can't be done properly manually. For measuring availability of materials, operations of surveying, mapping, detonating, detecting, for general security purposes drone can be used easily.

3.7. Health care-

With the increase in vital diseases and emergencies, the rapid delivery of medi kits, aids, medicines, etc. are needed. Drones can help patient to provide efficient healthcare from distance as well in a short span of time. F(ig.9)



Figure 9 Drones used for medical purposes.

With the help of drones, it will be very easy to deliver medicines from pharmacy to patient at door steps. Drones can make it possible to deliver blood, vaccines, snake bite serum, etc. to rural areas which could save life of many people. Blood delivery is currently in practice through drone, where there is an emergency and lack of time.

3.8. Shipping and delivery-

Drones have a wide range. They are also being used in in the shipping and delivery purposes. Many of the major companies in the world has started a new method for the delivery of their products. Sometimes it is a very difficult task for many companies for the proper shipment of the products being ordered by customers. For this purpose of shipping and delivery of the products they using the drones (Figure10)



Figure 10 Drones used by amazon.

By using the drones, a lot of manpower is saved and we can easily escape the issues of traffic which occurred frequently. It can be easily used for the delivery of small products like letters, medicines, foods, small packages, etc. Amazon - one of the major companies, has already started delivering its product through the drones in many areas. From 2014, Amazon Prime Air is being used in several areas of the world successfully. In the year 2017, UPS started the use of drone for its company.

IV. FUTURE SCOPE OF A DRONE

As per the increasing needs of the human, Science and Technology has been increasing rapidly. The drone has been come in use in a wide range in the past 15 years. Drones will be a major techno revolution in the future. It has a big range future scope. In the future the Drone will be used in most of the areas of work. By the use of drones, we will have better and easy lifestyle. Photographers will have a great opportunity to capture stunning aerial views. Most of the major companies will be using drones for their work in the future to make work more-easier and innovative. In the Farming and Agriculture sectors, drones will be mostly used and it will make the work of the farmers very easy. It can be used for emergency services like delivery of foods, medicines and other important things will become very much easier and will help out a lot of people. Drones will be used as the early warning systems. We can have the warning before the coming of any disasters, by using this. Drones can also be used for the purpose of gaming, entertaining and sporting. In the upcoming years drones will also be available for police services. China has already started using drone for such purposes. It can have a frequent use for the real estate, military and spy purposes. By this the development will increase by a greater percentage.

V. CONCLUSION

In this paper, we enhance about the wide uses or applications of drones in various fields and about the future scope of it. The technology of drones has increased a lot in the past few years. In the future it will be increasing furthermore and is all set to become a great commercial investment. The qualities of surveying and gathering data has increased in every sector through the help of drone. It has also become an important part of future of the conflicts. We have a number of drone innovations in present time. It is simply a facilitating technology of the era which is helping in our daily lives.

REFRENCES

- [1] TATHAM, P. (2009) An investigation into the suitability of the use of unmanned aerial vehicle systems (UAVS) to support the initial needs assessment process in rapid onset humanitarian disasters. *International Journal of Risk Assessment and Management*, v. 13, n. 1, p. 60-78.
- [2] Ivan H. BELOEV (2016). A Review on Curr ent and Emerging Applica tion Possibilities for Unmanned Aerial Vehicles. *Acta Technologica Agriculturae 3 Nitra*, Slovaca Universitas Agriculturae Nitriae, 2016, pp. 70–76.
- [3] UM Rao Mogili and B B V L Deepak, (2018). Review on Application of Drone Systems in Precision Agriculture. *International Conference on Robotics and Smart Manufacturing*, *Procedia Computer Science* 133, pp 502–509.
- [4] Berner, B., & Chojnacki, J. (2017) "Use of Drones in Crop Protection." IX International Scientific Symposium, Lublin, Poland, DOI: 10.24326/fmpmsa.2017.9.
- [5] XIE, T.; LIU, R.; HAI, R.T.; HU, Q.H.; LU, Q. (2013) UAV platform based atmospheric environmental emergency monitoring system design. *Journal of Applied Sciences*, v. 13, Issue 8, p. 1289-1296.
- [6] Srinivasan, S., Latchman, H., Shea, J., Wong, T. and McNair, J. (2004), "Airborne traffic surveillance systems: video surveillance of highway traffic", *Proceedings of the ACM 2nd International Workshop on Video Surveillance & Sensor Networks*, New York, USA, October.