International Journal of Scientific Research & Engineering Trends
Volume 5, Issue 2, Mar-Apr-2019, ISSN (Online): 2395-566X

Extending Capability of Air Drones in Military

Vibhor Rajawat
Dept. of Computer Science &Engg.
Poornima College of Engineering
Jaipur, Rajasthan, India
rajawatvibhor@gmail.com

***Abstract* - Giant AI and robotics leaps, drones and intensive defence hacking systems are no longer limited to science fiction films. Although the current systems are not advanced like the hand of Tony Stark, with each passing day, AI's defence applications are seeing rapid progress. Unmanned Aerial Vehicles (UAVs) contribute significantly to the warfare capability. UAV's assumption is that piloted, remotely piloted, and autonomous vehicles have advantages and disadvantages in military activities and vary in different levels of conflicting situations. This article shows the drones and their use possibilities. A drone is powered by batteries, which is the big drawback because after a few minutes of flight it is exhausted, causing the drone to fall on the ground. Military drones differ in size and driving mode from civil / civilian drones. This then includes fundamental legal perspectives to be taken into account when designing UAVs. Two extreme cases of drones and their companion robots have been shown.**

***Keywords*- Military drones; UAV (Unmanned Aerial Vehicles); NATO (North Atlantic Treaty Organization); Risk assessment; ethic values; Companion robots; Combat robots.**

I. INTRODUCTION

A number of civilian universities and military research institutions are already testing autonomous drones–they are advanced drones programmed with algorithms for countless human-defined courses of action to meet emerging challenges. Drone swarms (drones that follow and take tasks from other drones) depend entirely on autonomous processing. Autonomous drone testing is usually carried out using manned aircraft. It is an unmanned aerial vehicle (UAV) that usually carries ordnance from aircraft such as missiles and is used for drone strikes. This type of aircraft does not have a human pilot on board, which means that there is no need for human resources to be physically present on the drone. These drones are usually controlled by humans in real time, with different levels of autonomy.

The drones ' most important feature is that no additional infrastructure is needed to quickly register and monitor a designated area or object. The extremely short reaction time when commissioning and preparing the unit for a flight is an important advantage. There is no need for equipment necessary for a human pilot (such as a cockpit, armour, ejection seat, flight controls, safety resources and pressure and oxygen environmental controls) since the operator operates the vehicle from a remote terminal, resulting in a lower weight and a smaller size than an aircraft manned. One of the biggest challenges for aircraft development and approval is that it is extremely difficult to develop satisfactory validation systems to ensure that the technology is safe and that it acts as human beings would. In practice, such erudite drones would involve programming for an incredible number of combinations of alternative courses of action, making it impossible for manned aircraft to verify and test them to the level we are used to. There are also those who think of artificial intelligence–systems that learn to take action to new challenges and even develop themselves.

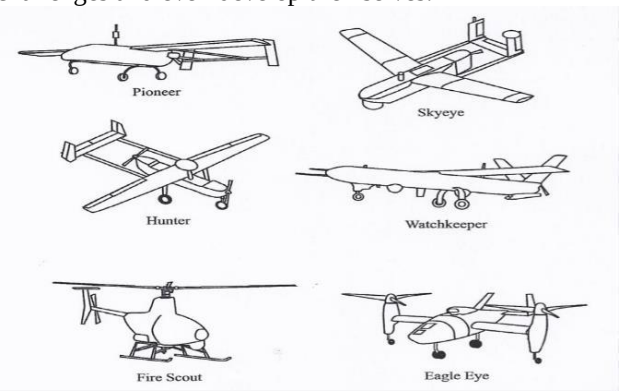

Fig.1 Some UAV Types.

II. NEED FOR AI

Artificial intelligence enables machines to learn from experience, adapt to new inputs, and perform tasks that are human-like. Most of today's AI examples–from chess-playing computers to self-driving cars–rely heavily on profound learning and natural language processing. Using these technologies, computers can be trained to perform specific tasks by processing and re-processing large amounts of data Because of its increasing importance in our daily lives, we need it. Changes are taking place in our lives because this technology covers a wide range of sectors that affect our daily lives. The technology overpowers the presence of humans. There is now a need

© 2019 IJSRET

for less human involvement and preferred more automatic technology. Starting with Siri, self-driving cars or automatic cars, robots are now taking the place of the human being. Our lives are changing, it has become a crucial part of technology. Because the AI algorithm generates its own knowledge, a system that embeds strong AI can learn without human assistance or additional data injection. Consequently, the external observer or the user of such agents will no longer know what the AI knows, what it can do, or the decisions it will take. Therefore, an ethical framework must be established that defines an area of action and prevents the system from taking decisions contrary to ethics.

III. POWER OF DRONE

A drone is powered by batteries, which is the major drawback because after approximately 15 minutes of flight it is exhausted, causing the drone to fall on the ground. The cells are a direct current source and can be divided into:

- Depending on the type of chemical reaction. Primary cells in which an irreversible chemical reaction followed the generation of electricity.
- Secondary cells in which reversible chemical reaction produces electricity and are designed to be charged by other sources of electricity.

The drones are powered by the lithium-polymer batteries. They differ with only a few properties and parameters from the Li-ion battery. The basic operating principle and the chemical reactions in the cell are the same as in Li-ion cells. The accumulators or accumulators' packs (cell series) must be equipped with an electronic battery management system to ensure emergency-free and safe operation. Classic electrochemical accumulators do not provide the basic requirement, which is a long residence time of a drone in the air from the user's point of view, despite the increase in their specific energy in recent years. Classification:

1.Small sizes
2.Small mass
3.Fast loading time
4.High safety of using
5.High durability
6.Negligible phenomenon of self-discharge
7.Low price.

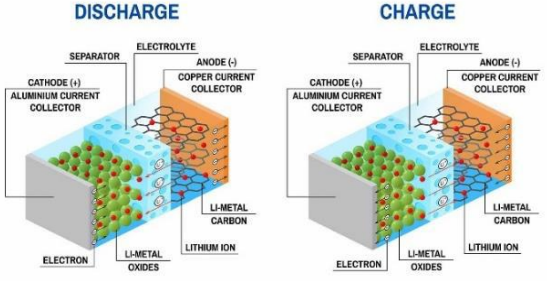

Fig. 2 Lithium-ion battery.

Li-Po technology makes use of following three forms: a dry solid that was largely phased out throughout the lithium polymer battery model years; a permeable chemical compound; or a gel-like electrolyte. The most popular is the last, which is the type of battery that can be find in new laptops and electric powered machines/gadgets like car. The above features make it possible to obtain a source of electricity with high energetic efficiency at the lowest possible volume at the lowest possible weight. And the possibility of fast charging enables the energy in the accumulator to be supplemented in a short time.

IV.CIVILIAN DRONES V/S MILITARY DRONES

1. Military- Smaller, lighter, quieter, stronger batteries, fuel or flight times, with better optics and capabilities, these machines will continue. Anywhere the military may avoid the risk of harming human resources, a drone may have an evolving future in the military. There are many uses in the military for drones:

- Every time a drone can be used to protect military men and women's lives; they will be armed with live video remote communications to ground troops, essential gear, or weapons.
- The main drone use in war zones abroad is recognition of unknown areas / buildings, enemy tracking and force protection (ensuring that our troops are safe and that no one approaches them).
- Drones are a great tool for searching for lost or injured soldiers as well as a real-time view of different missions and situations, enabling commanders to make better resource allocation decisions.

2. Civilian- Companies are already at work on customs to use long - flight drones to get act as a dead - end cell phone, sending platforms, emergency facility uses, automated data gathering for farming, livestock, and forestry.

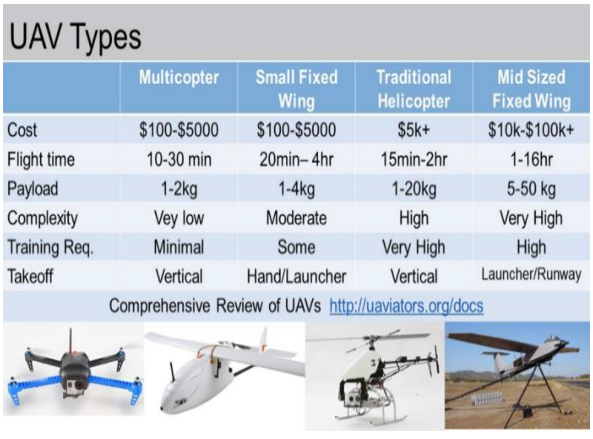

Fig. 3 Comparison of some UAVs.

© 2019 IJSRET

V. SOME OF THE LEGAL PERSPECTIVE TO BE KEPT IN MIND ARE

- Autonomous drones should only target legitimate targets (military targets and fighters) and attacks should not be expected to result in excessive collateral damage.
- A reasonable commander acting in good faith is required by law.
- How much human touch is needed?

VI. BENEFITS OF UAV

1. **Quality Aerial Imaging-** Drones can take aerial and video high-quality photographs and collect large amounts of image data. It is possible to use these high-resolution data to create 3-D maps and interactive 3-D models with many valuable uses. 3-D mapping of tragedy areas, for example, can enable liberation teams to be better prepared before they enter risky situations.
2. **Precision-** Since unmanned aerial vehicles are equipped with GPS, they can be programmed to accurate locations and get plotted. This is particularly helpful in agricultural precision.
3. **Easy to deploy-** this has resulted in drones becoming accessible to a wide range of operators, combined with the relatively low cost of most models. UAVs also have a wider range of movement than manned aircraft, allowing them to fly lower and in more directions, allowing them to navigate areas that are traditionally difficult to Access.
4. **Security-** Operators may use unmanned aerial vehicles with the appropriate license to provide security and oversight for private companies, sports events, public meetings and venues. Drones can also collect valuable data for security and recovery efforts during and after natural disasters.

VII. LIMITATIONS OF UAV

- Legislative uncertainty: how to determine the rights of airspace ownership and protect landowners from air traffic. Conflicts between federal regulations and some state and local laws are further added to the confusion.
- Safety: dealing with unmanned aerial vehicles is a primary concern. UAVs need to be programmed with "sense and avoid" capabilities to avoid mid-air collisions, which means being able to detect a potential collision with safety that matches the capabilities of manned aircraft pilots.
- Privacy: Privacy is one of the most common public concerns about UAVs. Without showing attention, drones can collect data and images.
- Since UAVs are piloted remotely, a data connection with the ground control system is required.
- UAVs are slower than manned aircraft.

VIII. WHERE DO WE STAND – AND WHERE SHOULD WE GO?

It's hard to predict the future, but autonomous drones ' technological potential is already being tested and developed. To what extent they will become important military technologies will depend on what the needs of nations will be, which will in turn be determined by the security situation of the future. Before we get to such a situation, it would be better to develop a legal and ethical framework. When autonomous military systems are deployed, the way responsibilities are assigned becomes less clear. And these potential gaps in responsibility need to be properly addressed through technical solutions and legal regulations. Therefore, NATO (Organization of the North Atlantic Treaty / Intergovernmental Military Alliance) and the Allies should engage in international discussions on these issues.

At the same time, technological development will continue and an autonomous drone remains a product, a tool in the hands of humans, no matter how technologically sophisticated it is designed. We can never morally "outsource" our fundamental responsibility for war and how wars are fought, least of all to machines. Two extreme cases, as indicated, can simplify automated drone management problems. UAV can be assigned distributed work, fighting drones with more power, range and device resources, especially for battle purposes. Companion drones, on the other hand, can be used to provide medical assistance to humans.

Fig. 4 Combat drone.

Fig. 5 Companion drone.

© 2019 IJSRET

IX.UAVS CLASSIFICATION ACCORDING TO THE US DEPARTMENT OF DEFENCE (DOD)

Table 1 UAVS Classification by US DOD

Category	Size	Normal Operating Altitude (ft)	Airspeed (knots)
Group 1	Small	<1,200 AGL*	<100
Group 2	Medium	<3,500	<250
Group 3	Large	<18,000 MSL**	<250
Group 4	Larger	<18,000 MSL	Any airspeed
Group 5	Largest	>18,000	Any airspeed

*AGL = Above Ground Level
**MSL = Mean Sea Level.

X. CONCLUSION

This article examined some issues of ethics and human values raised by artificial intelligence. This is an investigative review of the above-mentioned issues. The limited use of drones is largely associated with the short flight time, the discharge of the battery and the need for recharging. Certainly, earlier risks of privacy and citizens ' rights are mentioned as a major obstacle in the use of drones. We provided two extreme cases: fighting drones, death vectors (for battle purposes), and life-supporting companion robots (for medical purposes). It is necessary to study the ethics of AI and unmanned aerial vehicles (UAV) in combat based on military ethics and human values. Despite not being programmed to hurt humans or harm their self-esteem, companion robots may potentially jeopardize their social, moral and physical truth. An important ethical condition is that accompanying robots help nurses take better care of patients without replacing them. Synchronization strategy should include a number of areas of analysis, such as organization and doctrine, logistics and training, leadership and staff, facilities and legislation, to reduce operating costs and losses in human and material UAV missions.

REFERENCES

1. Barnhart R.K., Hottman S.B., Marshall D.M., Shappee E., Introduction to unmanned aircraft systems,CRC Press, 2012, ISBN 978-1-4398-3520-3, 215p.
2. Hejduk M (2015) The use of unmanned aerial vehicles drones supply courier. Thesis Inzynierska. Wroclaw.
3. Kardasz et al., J Civil Environ Eng (2016) Drones and Possibilities of their Using http://dx.doi.org/10.4172/2165-784X.1000233
4. Thibault de Swarte, Omar Boufous & Paul Escalle, Artificial intelligence, ethics and human values: the cases of military drones and companion robots (2018) https://Doi.Org/10.1007/S10015-019-00525-1
5. Gheorghe Udeanu, Alexandra Dobrescu, Mihaela Oltean, Unmanned Aerial Vehicle In Military Operations 10.19062/2247-3173.2016.18.1.26
6. Unmanned Aerial Vehicles in Logistics (2014) A DHL perspective on implications and use cases for the logistics industry

© 2019 IJSRET