Page 3227 - 3241 **DOI:** *https://doij.org/10.10000/IJLMH.1110134*

INTERNATIONAL JOURNAL OF LAW MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

Volume 8 | Issue 3

2025

Automatic Weapon System and Unmanned Drones

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ABSTRACT

This research paper explores the evolving landscape of automatic weapon systems and unmanned drones, with a particular focus on their legal, ethical, and societal implications. Beginning with the formulation of the research problem, hypothesis, methodology, and objectives, the study sets a foundation for analyzing how autonomous technologies are reshaping modern warfare and surveillance. A critical review of existing literature provides context for the technological advancements and global discourse surrounding these systems. The paper then delves into drone laws in India, highlighting the regulatory framework and challenges unique to the Indian context. Furthermore, it examines the risks, benefits, and ethical considerations posed by these technologies to society, emphasizing issues such as civilian safety, accountability, and privacy. Special attention is given to autonomous weapons and the ethics of artificial intelligence, assessing the moral boundaries and responsibilities involved in delegating life-and-death decisions to machines. The study concludes by synthesizing findings to offer insights and recommendations for future research and policy development in this critical field of defense and technology.

Keywords: *Autonomous Weapons, Unmanned Drones, AI Ethics, Drone Laws, National Security*

I. INTRODUCTION

As unmanned systems become increasingly prevalent in global militaries, it has become crucial to gain a deeper understanding of the societal implications of the rapid technological advancements in this area, including their ethical implications and effects on public policy. This paper will analyze the technological development and ethical considerations of fully autonomous weapon systems used within the US military and around the world to propose policy development to ensure a conscientious future of warfare.

The paper will deal with concept of Unmanned weapon system which in present times has become a threat to human lives and is new age warfare techniques and challenges it faces &

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issues which is need of the hour to have policy framework on drones to save human lives which are lost due to error in judgement by drones by hitting wrong target.

II. REVIEW OF ARTICLE

The title of the article is "Unmanned and Autonomous Weapons System" written by Sabriya Alam, Olivia Jimenez, Julia Taylor and Professor Dwaine Jengelley. The article discusses the unmanned systems which are become increasingly prevalent in global militaries, it has become crucial to gain a deeper understanding of the societal implications of the rapid technological advancements in this area, including their ethical implications and effects on public policy. This paper will analyze the technological development and ethical considerations of fully autonomous weapon systems used within the US military and around the world to propose policy development to ensure a conscientious future of warfare.[2]

Unmanned Systems (UMS) are broadly categorized as electro-mechanical systems able to perform designed missions without human operators aboard. These systems receive a mission from a human and accomplish that mission with varied Human Robot Interaction, depending on its level of autonomy. Human Robot Interaction (HRI) describes the level of involvement by humans in the engagement and control of the UMS to achieve the mission goals. There are 4 different modes of operation for an UMS: Fully Autonomous, Semi-Autonomous, Teleoperation, and Remote Control. The first mode of operation is full autonomy, which is where the UMS is expected to accomplish its mission without human intervention. A semi-autonomous UMS completes a mission with varying levels of HRI, but without being entirely controlled nor entirely autonomous.[3] Teleoperation is when the human operator uses sensory feedback to either directly control the UMS or assign incremental goals. The final mode of operation is Remote Control, which is where the operator directly controls the UMS on a continuous basis, which allows the UMS to fully rely on input from the user. Each mode of operation can be applied to the UMS in the military; however, the focus of this paper will be on fully autonomous unmanned systems, specifically Automated Weapon Systems.

III. DRONE LAWS IN INDIA

The Indian agency responsible for drone safety, DGCA, has provided many internet-accessible details on flying for fun or work. Drones are used in a wide assortment of sectors in India

[2] MacCarthy, M., Laura Martinez, J.T. and Jacob Taylor, K.K. (2021) *Applying arms-control frameworks to autonomous weapons*, *Brookings*. Available at: https://www.brookings.edu/techstream/applying-arms-control-frameworks-to-autonomous-weapons/ (Accessed: 15 June 2025).

[3] Sabriya Alam (2020) *Unmanned and Autonomous Weapons Systems: Practices and Related Policy*. Available at: https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1015&context=sppp (Accessed: 15 June 2025).

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including but not limited to the mapping and surveying of topographies, agriculture, security and surveillance, aerial photography and videography, navigation, infrastructure solutions for roads and highways including transportation management in high density urban zones, construction support, telecom services, LiDAR in mining, watershed management and monitoring emergency/ disaster situations.[4]

One such emerging use of drone technology is in the defense industry which show strong indications of use in future armed conflicts and tactical military campaigns. Information gathering and dive-bombing operations are certain other uses which drones find on the modern battlefield. In the consumer sector, commercial testing of drone technology for last-mile delivery of goods and services from businesses to customers in the sectors of e-commerce, healthcare, retail, and logistics are already in progress.

In the 2022 budget, the Finance Minister of India stated a need to introduce the Drone-as-a-service model in India especially in relation to the agriculture sector ("Kisan Drones").[5] It will include the use of drones to digitize land records, precisely monitor and assess the health of the crops, spraying of insecticides, pesticides, and nutrients etc. It is also notable that there are ongoing attempts to set up training institutes and establish courses and programs to increase the number of skilled personnel in the industry to apply drone technology in agriculture.

The Directorate General of Civil Aviation (DGCA) has released regulations for the operation of civil drones in India. Here is a brief overview of what we need to know:

Registration and Licensing: All drones must be registered with the DGCA, and operators must have a license to fly them. Registrations can be done on the "Digital Sky platform" operated by the DGCA which provides a single-window online platform for drone registrations and approvals related to drone operations.

Operator Requirements: Operators must be over 18 years of age, have completed a training course from a DGCA-approved institution, and pass a written exam. Once the drone operation license is issued, it is valid for 10 years.

Restrictions on Use: There are restrictions on where and when operators can fly drones. For example, operators cannot fly near airports or in densely populated areas. Before knowing about the permissions required for flying drones one must be aware of the various drone categories segregated by the government. They are:

[4] Sabapathy, E. and Saisunder, N.V. (2022) *Drone regulations in India*, *Lexology*. Available at: https://www.lexology.com/library/detail.aspx?g=21919d28-8dec-421c-a722-a4259be77991 (Accessed: 15 June 2025).
[5] https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/jan/doc202212810701.pdf

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1. Nano: Less than or equal to 250 grams.
2. Micro: Greater than 250 grams and less than or equal to 2 kg.
3. Small: Greater than 2 kg and less than or equal to 25 kg.
4. Medium: Greater than 25 kg and less than or equal to 150 kg.
5. Large: Greater than 150 kg.

Except in the nano category and micro category only for non-commercial use, all drone activities must be done only after receiving prior approval from the Digital Sky online platform for a flight or series of flights. The drone operator will also guarantee that the aircraft remains inside the stated area for which permission was granted, as well as provide an online log of each flight. For the nano and micro category, the 2022 rules state that for flying and operating tiny drones one does not need a permit. Moreover, the government is carving out drone corridors to facilitate delivery of cargo deliveries.[6]

The Indian Ministry of Civil Aviation (MoCA) has also deployed an interactive airspace map on the Digital Sky Platform for the convenience of drone operators and all other stakeholders. The map is color-coded into green, yellow, and red zones. While no permission is required to fly drones in the green zones, yellow zones are controlled airspace and need special permission to enter. Red zones are strictly no-fly zones. Red zones include areas such as military bases or nuclear power plants and other sensitive areas are restricted due to the risk of accidents or national security purposes.

India's ban on drone imports

As of February 2022, India has banned the import of all drones and components that can assemble to create drones. It is done to encourage the domestic drone manufacturing industry to become a global drone hub by 2030. Some exceptions are there to this import ban for the defense industry, security purposes, and research and development of the technology.[7]

The Indian government's ban on the import of drones is based on a two-pronged strategy: Firstly, that the development of indigenous technology will lead to a demand for products and drone-related services in local markets and will also enable the creation of employment opportunities. Secondly, to ensure the regulation of drone technology and to prevent its misuse

[6] Qureshi, M. (2021) *India's new drone policy: Who can fly drones? do you need licence?*, *TheQuint*. Available at: https://www.thequint.com/tech-and-auto/indias-new-drone-policy-2021-who-can-fly-drones-do-you-need-licence (Accessed: 15 June 2025).

[7] *Drone regulations in India: Legal service india* (no date) *Legal Service India - Law, Lawyers and Legal Resources*. Available at: https://www.legalserviceindia.com/legal/article-6389-drone-regulations-in-india.html (Accessed: 15 June 2025).

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within Indian territories leading to defense-related risks including information leaks.[8]

In India, before every operation of a drone, permission is mandatory. Drone operators can see permission via a mobile app (covered under the digital sky platform) which automatically grants or rejects the permission. The specifications of drones permitted for use in India require them to be incapable of take-off without permission. Operators of drones must ensure that they comply with all these restrictions. Failure to do so could result in penalties, including a fine of up to Rs. 1,00,000.[9]

IV. RISKS, BENEFITS AND ETHICAL CONSIDERATIONS FOR SOCIETY

DISADVANTAGES:

1. PRIVACY - While drone's benefits are endless, drone technology has several downsides to it. UAVs can quickly fall prey to manipulation and trespass a group or individual's privacy. Though many desire to utilize drones for retaining safety, it could violate numerous individual liberties in the name of public security.
2. LEGISLATIVE UNCERTAINTY - The use of Unmanned Aircraft Systems (UAS) has become widespread; however, the law is still developing, considering it is a novel technology in the industry. Specific practices installed for tiny drones also apply to commercial and recreational applications but are still vague in several dimensions. Rules for the regulation of drone movement and property protection from aerial trespassing are still in the making; thus, UAV technology functions in a judicial gray zone. There are numerous frictions between governmental regulations and any state or city laws to manage airspace property rights, because of which drone operators may violate rules they didn't know about.
3. SAFETY - Safety is a fundamental element to prioritize when operating drone technology. UAVs outfitted with high-quality sensors recognize possible collisions and safely engineer their way around them, making them a significant trait. These drone capacities must resemble those of the manned aircraft navigators. It is commendable to hire professional drone service providers who can operate an aerial drone without crashing it. Drones operated in heavily-populated regions have an amplified risk of ground impact or damage, mainly due to system malfunction or hacking.[10]

[8] Sabapathy, E. and Saisunder, N.V. (2022a) *Drone regulations in India*, *Lexology*. Available at: https://www.lexology.com/library/detail.aspx?g=21919d28-8dec-421c-a722-a4259be77991 (Accessed: 15 June 2025).
[9] Garg, R. (2022) *Drone laws in India*, *iPleaders*. Available at: https://blog.ipleaders.in/drone-laws-in-india/ (Accessed: 15 June 2025).
[10] (No date) *10 Major Pros & Cons of Unmanned Aerial Vehicle(UAV)* Available at: https://equinoxsdrones.com/b

4. SOFTWARE ISSUES OR MALFUNCTION - There have previously been many drones that have fired weapons to commoners, generating a significant number of casualties, injuries, and damages due to malfunctions or software blunders. Drone mishaps strike other military personnel's safety as well. Drones are still in the process of improvement to limit accidents or hazards that can affect the health and safety of human lives.
5. VULNERABLE TO WILD ANIMALS - Drones are susceptible to wild animal attacks and are sometimes also dangerous to nature. It is possible that when a drone operator is flying in a domain with a considerable number of wild animals, they crash against a tree or possibly conflict with a vulnerable animal. Large flying birds like eagles are regularly attacking and even capturing drones operating in their space to obtain crucial data.
6. SPYING: Many offenders employ drones as a strategy to target their victims and to maintain a track on them. The blatant propeller noises are no longer a concern and are unnoticeable, enabling criminals to invade someone's privacy. Many drones furnished with thermal and night sensors identify life signs and efficiently target those currently of interest by the spy. Since UAVs can seize accurate data, they can register regular habits and recognize suspicious activities without permission.
7. EASY TO HACK - One substantial downside to drone technology's growth is its vulnerability. Hackers can quickly attack a drone's central control system and become the drone's original controller. The primary control system includes significant knowledge crucial for hackers to evade without the initial operator's awareness. Hackers can acquire private information, corrupt or damage the files, and leak data to unauthorized third parties.
8. WEATHER DEPENDENT - Drones are more vulnerable to weather conditions when contrasted to traditional aircraft. For example, if the climatic conditions are unfavorable, the UAV will not maneuver appropriately or gather reliable data or imagery. However, there are drones available that are more stable and can withstand gusts of wind successfully.[11]
9. KNOWLEDGE AND SKILL - As discussed earlier, if one necessitates seizing accurate, high-quality data, they need to possess the demanded skillset. This specification would indicate that an average farmer would require comprehensive training or a third-party

log/10-major-pros-cons-of-unmanned-aerial-vehicle-uav-drones (Accessed: 15 June 2025).

[11] *revealing safety risks of unmanned aerial vehicles in construction*. Available at: https://www.researchgate.net/publication/353182463_Revealing_Safety_Risks_of_Unmanned_Aerial_Vehicles_in_Construction (Accessed: 15 June 2025).

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drone service provider to capture, process, and analyze farming data. With expanding operators in the industry, drone costs and its accompanying resource expenses will gradually reduce.

ADVANTAGES:

1. MAINTAINING SAFE ENVIRONMENT - UAVs are utilized in numerous occurrences due to their advancement in safety. With their remote control abilities, Drones monitor locations, communicate possible hazards, and notify threatening conditions.such as oil and gas refineries,pipelines and flare stacks. Not only this, Drone Technology is employed in the military during high-risk periods as well. Their features allow them to obtain real-time data to create and preserve a safe environment.
2. COST SAVING TECHNOLOGY - As drone's applicability becomes more extensive, their prices also drive towards being more pocket-friendly. People now acquire Drones not just for their industrial practices but also to fulfill their tech-savvy gadget's passion. UAVs are no longer equipped only for the military, law authorities, or the elite. Since UAVs take over several workforces, vehicles, and operation activities in commercial uses, many costs are preserved. For example, a Drone is more economical to buy, sustain, and fuel than airplanes for inspections. In addition, you don’t need to hire a ladder, aerial lifts, and other heavy equipment.
3. QUALITY OF AERIAL IMAGING -With their high-resolution cameras furnished with top-notch sensors, UAVs can take excellent Aerial Photographs, aerial videos and accumulate large volumes of accurate data. The data obtained is transformed into detailed 3D Maps and 3D Models for a complete analysis. 3D Mapping is particularly relevant to disclose cracks, damages, or other hazardous elements in disaster areas. Drones, when paired along with high-resolution images or 4K video abilities, is well-known for live streaming significant events such as entertainment, personal, political, and global affairs.
4. PRECISION - UAVs appropriate GPS (the Global Positioning System) in their software, which is why they can be programmed and guided precisely to specific locations. For example, in Precision Agriculture, a Drone Aircraft is employed to perform many farming obligations like pesticide spraying, identification of weeds, monitoring crop health, crop damage, crop assessment, field soil analysis, Irrigation Monitoring etc. This feature of precision through the GPS conserves time and expenses for farmers.

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5. EASY CONTROLLABLE OR DEPLOYABLE - The regular advancement in drone-control technology allows operators to quickly deploy and operate drones even with a relatively minimal technical background. With an extensive range of low-cost drones available for several purposes, drones are open to a broad spectrum of operators. Unmanned aerial vehicles (UAVs) have a more comprehensive range of movement, fly lower in all directions, and can navigate effortlessly when contrasted to a crewed aircraft.
6. SECURITY - Another advantage that weighs out the pros and cons of a drone is the security centered around them. With relevant permissions and licenses, drone operators can utilize an Unmanned Aircraft System (UAS) to render safety and surveillance to private organizations, potential venues, and other expenses. Drones can also accumulate reliable information from natural catastrophes to support safety and recovery efforts.
7. REACH HAZARDOUS AREA - UAVs make obtaining efficient data from hard-to-reach locations a cakewalk for industry professionals. It is the most suitable alternative to overcome limitations of traditional methods regarding worker's safety, especially in hazardous situations like radiation monitoring, inspecting high-voltage lines. Drones also allow a more cost-effective approach toward inspections of these locations.

V. AUTONOMOUS WEAPONS & THE ETHICS OF ARTIFICIAL INTELLIGENCE

While “killer robots” have long been a staple of science fiction dystopias, they also represent a critical and central issue in the ethics of artificial intelligence (AI). More technically speaking, autonomous weapons are a real and emerging technology that have the potential to radically transform warfare, policing, and how we understand human rights in relation to the operations of machines, algorithms, and AI. The issues raised by giving machines the capability and, more important, the authority to kill human beings raises a range of ethical as well as legal, social, and political issues. Many of these issues are of critical importance even if we consider only simple forms of automation, or artificial stupidity. Other issues arise if we consider the difficulty of properly gauging the capabilities and reliability of increasingly sophisticated forms of AI. And yet other issues arise if we consider the remote advent of some form of an artificial general intelligence (AGI), human-like AI, or superintelligence. Because the issues raised by simple autonomous weapons are the most urgent, I will focus on these. But I will also consider some of the issues raised by increasingly capable systems, and reflect on the implications of highly capable future AI.

In considering a few of the most significant issues raised by autonomous weapons, I will seek

to articulate them according to some major philosophical approaches to ethics. As such, I will not endorse any particular approach. Roughly speaking, my approach is that where there is broad agreement that moral rights and duties exist and are clear, they provide reasons that are more compelling than utilitarian reasons, while utilitarian reasons are useful in the absence of clear moral duties and rights. Further, I believe that moral virtues and sentiments reflect psychological and cultural norms and preferences and often function as heuristics in moral reasoning, especially when one must choose between competing duties and values and when one reflects on the implications for one's own moral character when taking an action. While no single moral theory alone can fully explain our views of autonomous weapons, each of the leading Western moral theories deontological and consequentialist points to the immorality of autonomous weapons in its own way, and taken together the leading moral theories present a clear case that building and using autonomous weapons, and permitting or authorizing autonomous violence, is morally wrong.

The Moral Problems Raised by Autonomous Weapons

In providing a moral analysis, it will also be helpful to lay out the various types of issues that have been raised as problems with autonomous weapons. These represent a range of different concerns and can potentially be characterized differently under different moral theories. Yet each set of concerns also lends it- self to one or more moral approaches. The concerns can be grouped together into some broader categories: harms to civilians, arms races and international instability, intrinsic unpredictability, hacking and cybersecurity threats, a new type of weapon of mass destruction, threats to responsibility and accountability, and threats to human rights and dignity. Along the way we will also consider arguments that autonomous weapons and their use might be morally superior to human-controlled weapons.

Harms to Civilians

By far the most commonly expressed concerns around autonomous weapons are that they will kill innocent civilians and destroy civilian infrastructure. Such a concern may seem quite simple and straightforward, but there are different ways to characterize this worry. Following the formulations of international humanitarian law, which requires military attacks to be discriminate and proportionate, one could argue that autonomous weapons will be indiscriminate in their targeting, failing to distinguish civilians from combatants. One could also argue that autonomous weapons might make disproportionate attacks, killing many civilians for a relatively low-value military objective. One could alternatively argue that autonomous weapons would lack aspects of human psychology that might make them more

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humane in warfare. They might thus be far more aggressive or fail to show any compassion in situations where a human might be merciful. Worse, autonomous weapons could be easily designed, altered, or manipulated to purposely harm civilians (i.e., given such a goal either explicitly or implicitly). Despots and tyrants might turn such weapons against their own people or apply them to genocidal ends, or terrorists might use them to attack civilians. Despite the various ways autonomous weapons might cause negative impacts on civilians, it is possible to group these concerns together.

Arms Races, Rapid Proliferation, and Instability

Another broad range of issues concerns the impact of the introduction of autonomous weapons in the context of international relations. Insofar as these weapons are seen as high-tech and prestigious, as well as providing tactical or strategic advantages over the capabilities of adversaries, or serve as an effective deterrent, there will be strong incentives for countries to develop or obtain such weapons. The same logic, of course, applies to their adversaries and competitors. This is the logical foundation of a competitive arms race wherein rivals expend large amounts of resources in an effort to gain military advantage over their competitors. Apart from being an expensive use, or waste, of economic, intellectual, and natural resources, such arms races are tied to political and military instability. Since significant military buildups and strategic advantages are viewed as threatening to neighbors and adversaries, some states may consider preempting such advantages rather than allowing them to develop.

As such, arms races can raise tensions and create instability. Having access to new high-tech weapons, especially ones untested in real conflicts, can also give leaders a sense of having superior military capabilities, which in turn makes them more inclined to initiate or escalate military actions whether or not their confidence is warranted. And insofar as the weapons themselves may behave or perform in unexpected ways due to AI, they become less predictable as threats by adversaries, leading to greater instability. Such arms races and rivalries can operate at regional levels between neighboring states, or at global levels between superpowers and groups of aligned states.

Unpredictability

Another fear is that autonomous weapons could simply go out of control and do things that are completely unintended or highly unpredictable. While armed conflict is always unpredictable, such systems could add a whole new level of un- predictability. On the one hand, there is the possibility of such systems initiating or escalating a conflict without any human political or military decision to do so. While this can sometimes happen due to the unauthorized actions or

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mistakes of military personnel, humans are capable of recognizing the larger implications of their actions and can seek confirmation from superiors, while automated systems are not capable of this.

The operator of an autonomous system may have a general idea of what the system is supposed to do, and may further have operational experience of how it operates in various specific contexts. But insofar as autonomous weapons are designed to operate over large geographic areas and time frames, and given that the possible interactions with the environment it may have grown exponentially, it will become increasingly difficult for even well-trained operators to reliably predict what a system will actually do once deployed. Testing and reliability metrics can offer confidence to operators only when systems are deployed in situations and contexts that match those under which it has been previously tested, while increasing ranges and time frames imply that operators are less aware of the specific characteristics of the environment the system will encounter.

Further, there is much interest in developing large fleets and swarms of autonomous weapons systems. Such large ensembles of autonomous systems, even relatively simple ones, are known to be intrinsically unpredictable, from a mathematical perspective. But even a small number of autonomous systems interacting with each other, when we know how only some are programmed, are unpredict- able because we do not know how an adversary's systems are programmed or what the net result of interactions between them will be. This issue is similar to that of various computer trading systems, whether for pricing products for online markets like Amazon or for trading stocks. Both have manifested unexpected positive feedback loops resulting in million-dollar books being listed for sale on Amazon and in major trading market crashes, such as the one at the New York Stock Exchange in 2010, called a flash-crash, that lost 9% of the market's value in just a few a minute.[12] However carefully programmed and tested autonomous weapons are, such catastrophic incidents will remain highly probable or inevitable if large numbers of autonomous systems are deployed. The consequences, however, could be far worse if those systems are controlling weapons instead of trading stocks or selling books.

Vulnerabilities to Hacking, Spoofing, and Cyberattacks

It is possible to create autonomous weapons that do not use programmed computers; we could even consider landmines as the "stupidest autonomous weapons" on the basis of their lack of discerning sensors or computational functions. However, it is much more likely that we will see

[12] Nath, T.I. (no date) *How drones are changing the Business World*, *Investopedia*. Available at: https://www.investopedia.com/articles/investing/010615/how-drones-are-changing-business-world.asp (Accessed: 15 June 2025).

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computational technologies involved in the decision processes of most autonomous weapons, as well as a variety of sophisticated sensors providing inputs to those decision functions. And given the nature of armed conflict, it is very likely that adversaries will at- tempt to interfere with autonomous weapons directly through cyberattacks that impair, disable, or take control of those systems, or indirectly by fooling or "spoofing" those systems through their sensors and what is known about how they process information.

Spoofing is a form of tricking an automated system to do what you want it to by manipulating its sensor data. One could do this by attacking its sensors or simply manipulating what those sensors capture. A well-known example of this is spoofing GPS geolocation sensors. These sensors respond to signals from GPS satellites in space and compute their location from the signals of multiple satellites. It is possible to bombard these sensors with signals that imitate the satellite signals but are much stronger. If, for example, an autonomous drone aircraft is attempting to fly to a certain coordinate, it is possible to force it to fly wherever you want by systematically manipulating its GPS inputs. It is not unreason- able that this and many other means might be deployed to spoof autonomous weapons, including baiting them to attack the wrong targets, expend there am- munition, or even turn them against civilians or the military that fielded them.[13]

Indeed, recent research in machine learning has demonstrated that because the data spaces over which deep-learning algorithms learn is so vast, it is possible to develop what are called generative adversarial neural networks which can systematically deceive a trained neural network so as to trigger any desired output. Moreover, it can do this with, for example, visual images that appear to the casual human observer to be identical to images that normally have a very different output. For example, two images of a "Stop" sign might appear identical to human observers, yet one could cause a self-driving car to stop as it should, while the other could be designed by an adversarial network that figured out a few select elements of the image that, when altered, will trigger the neural net- work to instead recognize this as a "Speed Limit 55" sign. This is a major and fundamental problem within machine learning, with no apparent solution. As long as it remains unsolved, any autonomous weapon that employs such machine-learning techniques would be susceptible to manipulation, including making enemy combatants look like civilians, and friendly forces look like threatening adversaries.

VI. Conclusion

Given the moral obligation to ensure that weapons are used only against justified and lawful

[13] https://static.pib.gov.in/writereaddata/specificdocs/documents/2022/jan/doc202212810701.pdf

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targets, what is the best way to realize this obligation? The discussions by states at the United Nations Convention on Conventional Weapons has repeatedly asserted, with consensus, a few key points in this regard. First, that inter- national humanitarian law applies in all cases of armed conflict and to all weapon systems. Accordingly, the Geneva Conventions, which require commanders to take all precautions to protect civilians in every attack, as well as to review all "new weapons, means and methods of warfare" for their compliance with the law under Article 36 of Additional Protocol 1 of the Geneva Conventions, also apply to any autonomous or highly automated weapons. But how to ensure these obligations are met actually requires that there is space for human reasoning and moral consideration within decisions to use violent force.

It has been proposed at the UN's Convention on Certain Conventional Weapons discussions that what is needed for this is a requirement for "meaningful human control" over the targeting and engagement of all weapons. This could be viewed as the positive obligation that mirrors the negative obligation of not delegating the authority or responsibility for lethal decisions to machines or automated processes. But this term serves other functions and deserves a bit of unpacking. While "control" does most of the work in terms of moral responsibility, the "human" element is clearly the one that stands out as a requirement for the nondelegation of certain authorities. There is a sense in which software, and automated systems in general, are authored and created by humans and could be seen as a form of human control. While this is acceptable in certain situations, such as automatic doors and thermostats, the decision to use violent force and take human life requires a human capable of assessing the situation, determining the necessity to engage a weapon on a target, who has access to the moral and legal justification for the use of violent force, and who can take moral and legal responsibility for the consequences of that decision. Together these elements add up to something we can describe as "meaningful."[14]

The "human" element of the term is meant to carry the full burden and responsibilities of moral and legal agency. By virtue of being a morally responsible human, one has an understanding of the value of human life and human dignity that cannot really be represented in a calculation. It is the human condition, and our particular relationship with mortality and life, that informs and grounds our morality. It is the human, or group of humans, who controls a system who is responsible for it and the consequences of the actions taken by the system.

It could be argued that we might be able to build artificial agents who are in fact capable of

[14] Jayakumar, P.B. (no date) *Precision from the skies: India's drone moment is here as uavs prove their mettle on the front line*, *Fortune India*. Available at: https://www.fortuneindia.com/business-news/precision-from-the-skies-indias-drone-moment-is-here-as-uavs-prove-their-mettle-on-the-front-line/122940 (Accessed: 15 June 2025).

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moral agency. If that were possible, would it be acceptable for such entities to make decisions and take actions to kill humans? I am skeptical that we understand the nature of moral agency sufficiently to automate it. While we can create models of moral decision making and teach machines to follow them, or even simulate aspects of human psychology, these are not really the same thing as being a moral agent and taking responsibility for one's own actions. While we cannot prove in principle that it is impossible to replicate the capacities in artificial systems, it would be extremely challenging and would itself be immoral. Furthermore, even if we succeed in creating artificial moral agents, we still might not consider them human persons, but perhaps a more alien form of being, de- serving of respect perhaps but not necessarily entitled to judge when it is accept- able to take human life. At any rate, for the foreseeable future we should work to ensure that autonomous systems are not given the authority to use lethal or violent force against humans.

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 [ISSN 2581-5369]