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An Analysis of Existing International Humanitarian Laws to Accommodate the Application of Artificial Intelligence in the Military

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Abstract: At every stage of evolution there has persisted a war in the society, either in the form of an armed conflict or plainly the struggle to change and adopt to the evolving world. Wars have played a significant role in these scenarios by reason of their ability to accelerate change at a much faster pace than the simple process of evolution would allow by itself. Over the course of history, the human race has managed to protect itself from the detrimental impact of war by adopting International Humanitarian Laws which promotes controlled effect of war on humanity and ensured that any conflict did not impede the society from growing. These International Humanitarian Laws have certain basic principles, the compliance of which has become inevitable for all states under International Law. The introduction of the Industrial Revolution 4.0 with significantly new technologies such as Artificial Intelligence (AI) has paved the way for a deviation from traditional armed conflict into introduction of technological applications in the military which would have a significant impact on the resultant effects of war. The impact may be positive or detrimental based on its application. The introduction of these technologies has rendered us to question the effectiveness of the pre-existing principles of International Humanitarian Laws to control and regulate armed conflict and its impact on human society. Hence, this paper aims to study both the positive and negative implications of using AI in the Military and understand the level of effectiveness of the existing principle of IHL in accommodating such new technologies. The paper also gives suggestions for any requisite changes that may be made to the existing legal framework to better regulate application of advanced technologies in the military.

***Keywords*:** International Humanitarian Laws (IHL), Artificial Intelligence (AI), Military, Lethal Autonomous Weapons Systems (LAWS)

1. BACKGROUND OF THE STUDY:

The concept of war has been in existence as long as the existence of human civilization itself. It has helped in shaping society as we see it today. Violence was inherent in human nature and war provided a direction to such violence. Initially wars were fought with handmade weapons but with the industrial development the weapons of war transformed from handmade weapons to guns and bombs. This has now transformed into AI guided applications in military operations. It is with the increasing inventions connecting AI based technologies and military equipment that the need to analyze and understand the need for a new set of laws to govern these AI based military operations arises. The existing set of laws and principles under International Humanitarian Law were ideas of the 20th century and the recent technological advancements in the 21st century such as a rise in

usage of strong AI systems in military has led to question the sufficiency of the pre-existing principles of the law of armed conflict. The increase in the usage of AI is not limited to social media but its implications extend far and wide to include military equipment and technologies. The usage of AI in military has been studied and its potential uses have been researched in detail in the past decade. These uses are now being implemented by many States where various private companies focusing on building military equipment has merged the applications of AI with military operations. It is not only applicable to applicable to weapons systems but also helpful in planning phases of a war, data analysis, strategic decision making. These potential uses of AI in war have resulted in both positive and negative implications. While the use of AI in military guarantees more precision in wars and provides a competitive advantage to States that possess better and much developed technologies, it may also increase non-compliance with the existing laws which is perilous to society and may lead to the deterioration of humanity. Therefore, the current usage of AI in military is mostly with meaningful human control and autonomous systems are still under experimentation.

2. LITERATURE REVIEW:

1. Various applications of AI in the military

- **Svenmarck, P., Luotsinen, L., Nilsson, M., & Schubert, J. (2018, May)**[1] discusses the usage of AI in enhanced military operations for purposes of surveillance, underwater mines warfare and other cyber security issues. The paper also discusses the usage of machine learning in military for transfer learning, modelling and simulation purposes.
- **Rashid, A. B., Kausik, A. K., Al Hassan Sunny, A., & Bappy, M. H. (2023)**[2] discusses the several uses of AI in improving military operations such as autonomous weapons systems for targeting and other autonomous vehicles, robots on the battlefield, healthcare, surveillance, training and simulation for combat, transportation and logistics. The paper also discusses various patterns observed in AI such as personalization, recognition of patterns, conversations, autonomous systems and predictive analysis.
- **Ams, S. (2023)**[3] deals with threat to human rights by the application of AI in military giving rise to an authoritarian police state.
- **Ekelhof, M. A. (2024)**[4] focuses on the influence of AI in the planning phases of a war and how the targeting process must ensure meaningful human control.

2. Lethal Autonomous Weapons Systems (LAWS)

- **Bills, G. (2014)**[5] discusses the compliance of LAWS with international laws. The paper also discusses whom to be held responsible and legally liable in case of a violation of existing international humanitarian law principles.
- **Bhuta, N., Beck, S., & Liu, H. Y. (Eds.). (2016)**[6] analyses the legality, ethics and morality of the usage of autonomous systems in armed conflict.
- **Klare, M. T. (2019)**[7] is based on the application of autonomous weapons systems by US Air Force to use unmanned aircrafts and training such technology to fight in combats.
- **Amoroso, D., & Tamburrini, G. (2020)**[8] also discusses the ethical and legal issues that arise when using autonomous weapons systems. It also discusses the concept of meaningful human control.

[1] Svenmarck, P., Luotsinen, L., Nilsson, M., & Schubert, J. (2018, May). Possibilities and challenges for artificial intelligence in military applications. In *Proceedings of the NATO Big Data and Artificial Intelligence for Military Decision Making Specialists' Meeting* (Vol. 1).

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STATEMENT OF RESEARCH PROBLEM:

The literatures available relating to AI and Military discuss only the various applications of AI in the Military, and compliance of Lethal Autonomous Weapons Systems (LAWS) with principles of war. Our paper intends to discuss the legal compliance of every application of AI in military and its related compliance with the principles of war.

RESEARCH METHODOLOGY:

This paper follows a doctrinal research methodology. It studies the existing IHL laws and legal principles to determine the extent of its adequacy in application of AI based technologies in the military.

RESEARCH METHOD:

The paper studies the potential applications of AI in military and existing principles of International Humanitarian Laws (IHL), thereby analyzing the scope of compliance of such AI driven military applications in accordance with existing laws. Based on such analysis findings and suggestions are given to that regard in relation to the need for new laws to regulate new AI technologies in military. For this purpose, reference has been made to various literatures relating to the topic and general principles of international law derived from the conventions and treaties in laws of war. The paper uses both primary and secondary sources of data.

RESEARCH QUESTIONS:

1. Whether the existing principles of International Humanitarian Laws (IHL) have the ability to solve legal issues concerning the usage of AI in the military?

2. Whether there is a requirement for new laws to better regulate the application of AI in the military?

RESEARCH OBJECTIVES:

1. To understand the extent of applying AI in the military.

2. To study existing principles of war and analyze its ability to handle legal issues relating to the application of AI in military.

3. To determine whether there is a need for new laws to govern AI in military based on an analysis of the level of compliance of AI driven military applications with current principles of armed conflict.

INTERNATIONAL HUMANITARIAN LAWS:

International Humanitarian Laws (IHL) refer to the laws that regulate armed conflict and controls impact of war on human society. It is alternatively referred to as laws of war or armed conflict. IHL protects humanity from immense damage as an effect of war by imposing certain rules and restrictions on the States engaging in war. This ensures that any armed conflict may be resolved without interfering with the functioning of the society. The main aim of IHL is to protect humans while also containing the resultant damage of wars. This law is created under the assumption that war is not preventable under all circumstances and if such a situation were to occur then it was the responsibility of the States to ensure that the resultant damage of war does not destroy the society. IHL aimed to protect civilians from effects of armed conflict and recognized the need to provide for a secure society.

IHL is a subset of International Law and it consists of various conventions, treaties and customary rules of law. It is from these laws that core principles of IHL have been derived. To better understand IHL, it is pertinent to learn the various principles of the laws of war.

[8] Amoroso D & Tamburrini G, 'Autonomous weapons systems and meaningful human control: ethical and legal issues' (2020) 1 Current Robotics Report, Springer 187

PRINCIPLES OF IHL:

There are certain fundamental principles of IHL that have developed over the years from different conventions and treaties. Each one of these principles helps in controlling the impact on civilians and combatants under certain circumstances. They are discussed below in detail.

Principle of Humanity:

This is one of the most fundamental principles of IHL. According to this principle, people who are not involved in war must be treated in a humane manner and the consequences must not affect basic human rights till effect possible. Hence it is implied that human rights are not absolute during an armed conflict. These principles also prevent inhumane treatment of soldiers stuck behind enemy lines. The main aim behind this principle was to recognize that war, death and destruction were necessary and inevitable but its consequences on civilization must be controlled by protecting humanity in the battlefield. The main reason for the origin of this principle is to establish the importance of humanity, which was absent in the War of Solferino, 1859. The sufferings of this war had a great impact on Swiss businessman Henry Dunant's mind. It led him to establish the International Committee of Red Cross in 1863. It also led him to draft the first Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field in 1864[9].

Principle of Military Necessity:

The principle of military necessity refers to the use of methods of warfare that are absolutely necessary and should not break the bounds of the Geneva Convention unless it is justifiable before a court of law. This application of the principle of military necessity can be referred to Article 51(5)(b) of the 1977 Additional Protocol I to the 1949 Geneva Conventions[10]. It was also observed in *United States v. List et al*[11] (popularly known as The Hostage Case) that the absence of principle of military necessity nullifies the object of international laws regulating armed conflict. This principle functions alongside other principles such as the principle of humanity and principle of proportionality.

Principle of Distinction:

The principle of distinction states that it is essential to distinguish between civilians and combatants and attacks must be aimed only at combatants. It also states that only military objects must be attacked and not civilian objects. This principle aims to prevent civilians from the impact of war by not allowing the application of the principle of non-discrimination. This principle can be derived from Articles 51(4) and 51(6) of Additional Protocol I, 1977 to 1949 Geneva Convention.[12]

Principle of Proportionality:

This principle is based on Article 51(5)(b) of the 1977 Additional Protocol I which prohibits military attacks if the results of such attack would cause extensive damage to civilian life, their objects and society[13]. Therefore, nations must weigh the loss and damage of a potential armed conflict before engaging in such practices.

CONCEPT OF ARTIFICIAL INTELLIGENCE:

Artificial Intelligence (AI) refers to ability of machines to perform tasks at a level which equates or surpasses the bounds of human intelligence. It vests machines with the power to make decisions and perform functions either of its own intelligence through data that has been given to such machinery or by scope of directives given through human interference. [14]

[9] https://www.nobelprize.org/prizes/peace/1901/dunant/speedread/

[10] https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-51

[11] https://www.worldcourts.com/imt/eng/decisions/1948.02.19_United_States_v_List1.pdf

[12] https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-51

[13] https://ebooks.inflibnet.ac.in/hrdp08/chapter/doctrine-of-military-necessity-and-principle-of-proportionality/

[14] https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence

AI was categorised into Narrow AI, General AI and Strong AI by John Searle in his experiment Chinese Room Argument which aimed to understand the abilities and challenges pertaining to AI[15]. Based on this classification, Narrow AI works based on detailed instructions given by humans, General AI functions of its own accord with the help of data that has been presented to such machinery, and Strong AI is the only kind of AI that does not require human intervention where automation is possible to a greater extent.

Applications of AI in Military:

The scope for the use of AI in military operations is wide and does not restrict itself to autonomous weapons systems, the popularity of which foreshadows other possible functions and applications of AI in military.

The following are the varied usages of AI in military:

- Decision Making Systems
- Threat Monitoring
- Healthcare in Battlefield
- Logistics, Predictive Analysis and Transportation
- Training and Simulation
- Lethal Autonomous Weapons Systems (LAWS)

COMPLIANCE OF AI BASED MILITARY TECHNOLOGIES WITH EXISTING PRINCIPLES OF IHL:

Decision Making Systems:

AI provides a significant advantage by introducing advanced technologies that can analyse given data in large quantities and help in decision making processes in the military. It ensures effective decision making without human intervention with availability of valuable information and advanced technologies.

In theory, it also helps in upholding the principle of distinction. Although in practicality it has been shown to have high risks of misidentification and the scope for error would increase which would be avoidable by application of human judgement.

The same has been observed in case of other principles such as proportionality and military necessity.

The usage of AI in decision making in real time without human intervention is challenging thereby affecting principle of proportionality.

The principle of military necessity is affected as consideration of military necessity requires application of human mind and is not effectively achieved by AI driven systems. These systems have a likely possibility of causing automation bias which may result in over dependence on AI systems in decision making systems and ignoring useful human instincts and experience.

Threat Monitoring:

The application of AI algorithms to monitor threats based on real time data is advantageous as it reduces risk of threat from enemies. This is an advantageous use of AI in the military to the extent that it is still kept under meaningful human control and cannot override actions or orders of officers in the military. The excessive usage of AI may result in violation of principles of military necessity and principle of humanity by increasing risks of attacking civilians and causing unnecessary deaths.

[15] https://iep.utm.edu/chinese-room-argument/

Healthcare in Battlefield:

AI used in the battlefield may assist doctors during times of duress and help in analysing the medical history and previous treatment undergone by such patient. It can then compare such information with the current symptoms presented by a patient to make a proper diagnosis in a short period of time. However, this use of AI in medicine does not account for data bias and algorithmic bias which may have a significant impact on chances of survival of the patient in critical times. It may also result in the wrong diagnosis. Though it does not affect the application of any laws of war, certainly the shortcomings in civilian medicine needs to be fixed before proceeding to apply AI based healthcare in war.

Logistics, Predictive Analysis and Transportation:

The truly efficient use of AI in military logistics helps in increasing efficiency in supply chain management. It is observed to have increased efficiency, as well as reduce time and resources. It has reduced cost and enhanced savings on logistical functions. It helps tracking of necessary products and services easier.

AI has also helped in analysing huge amounts of data and providing predictive analysis on the rate of occurrence of accidents and number of deaths as a result of applying a particular military strategy. It also forecasts supply demands thereby saving time and finance.

Smart transport solutions are also a result of effective application of AI in military as it provides effective solutions to transportation issues and helps to ensure that supplies reach on time.

There is a risk of cyberattacks which makes such technologies vulnerable to enemy countries during war. There also exists the questions of accountability in case of an error by reason of data bias and compromised security. There is another criticism to this application that it cannot substitute for human instinct and experience.

Overall, using AI for logistics in the military may affect the principle of military necessity as a result of wrong predictions, delay in transportation of necessary materials which may be caused by deceptive practices such as cyberattacks and feeding false data.

Training and Simulation:

Using AI for purposes of training and simulation assists in strategizing and deciding on the best course of action in every possible situation during war. It also helps soldiers in adapting to automation in a better manner, without difficulty from inexperience and lack of understanding while applied in the field. This application does not affect the principles of war in any manner. It helps in ensuring principle of military necessity by properly training soldiers to use AI driven technologies in military operations, which in turn reduces risk of death.

Lethal Autonomous Weapons Systems (LAWS):

Lethal Autonomous Weapons Systems or LAWS refers to such weapons systems which can function autonomously without any input from humans. It can act of its own accord based on data already made available to such devices. This can be dependent on AI algorithms that possess the capability to imitate human behaviour under specific parameters. It is used mostly to refer to robots that can function without human intervention and direction. It is assumed that such autonomous systems have the capability to make decisions and perform functions independently only on the basis of given real time data, its analysis and altering behaviour suitable under different circumstances.

The use of LAWS in military is already existent in cases of target systems and threat monitoring under considerable limits of human control, but the concept of robots and other advanced application of AI that can function without meaningful human control is still a work in progress.

If these advanced AI based autonomous systems are used in the military, then it shall result in the violation of principles of military necessity, proportionality and distinction. This is a result of non-existence of meaningful human control which leaves lapse in judgement arising out of algorithmic and data driven biases unregulated further causing loss of lives of civilians and cause great destruction.

SCOPE AND LIMITATION OF THE STUDY:

- The study of AI in military and analysis of the extent of compliance of such technologies with existing principles of laws of war helps understand whether there exists a need for new laws to regulate usage of AI in military. This prevents loss of human life and reduces the risk of violation of existing laws by any State under International Law.
- This study helps understand the violations to existing principles of IHL if left unregulated and the necessary changes are not made for this purpose.
- The paper is limited in relation to technical discussions on application of AI in the military.
- The study also does not focus on fixing liability for actions of AI as it would extend beyond the scope and objective of this paper.

FINDINGS AND SUGGESTIONS:

- On the basis of the study undertaken and the analysis conducted it is evident that the application of AI based technologies in the military is likely to cause a violation of the general principles of International Humanitarian Laws (IHL).
- The usage of AI in military in various instances destroys the objective of the principles of military necessity and distinction.
- Therefore, this paper suggests a strong need for new laws governing AI application in military to prevent future violations of International Humanitarian Laws (IHL) by any States under International Law for gaining strategic and technical advantage during war.
- If new laws are not enacted to regulate AI in military operations, the disadvantages of using AI would outweigh its advantages thereby destroying the very root of International Humanitarian Laws (IHL).

CONCLUSION:

This paper, after analyzing the potential usages of AI in military and its accommodation of existing principles of IHL has arrived at the conclusion that there is a need for new law to specifically govern this aspect of humanitarian laws. The new law must be strict in nature such that, it is capable of preventing any violations by States to gain strategic and technical advantage over its enemies. This is considered necessary as any violations from such illegal usage may have detrimental effects on the society. Therefore, this paper strongly advocates for new laws to control the usage of AI in military as any violation would obliterate the progress made in IHL over the course of history.

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