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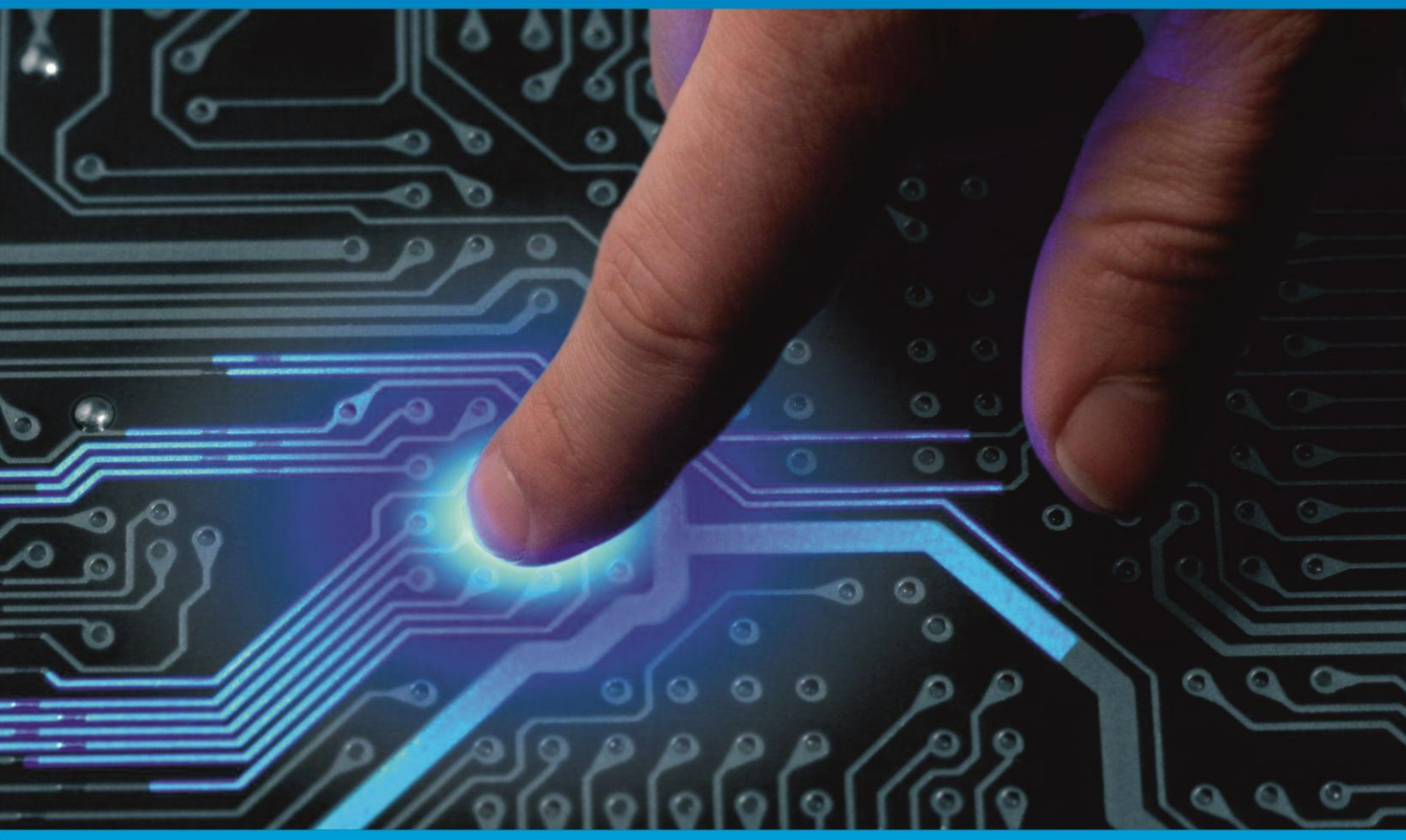

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A Study on Artificial Intelligence and its Impacts on Defense

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ABSTRACT: AI is a rapidly developing field of technology. The innovations in the field of defence are increased day by day,Where AI plays important role. For the department of defenseit will impact its missions, and in a larger extend, change the character of the future battlefieldWhich is potentially important for national security. AI could be used into weapons and surveillance systems to increase its performance.It will change the todays informatized warfare to future intelligentized warfare. The main aim of this research is to find out the use cases of Artificial Intelligence in defence and its impacts on it.

KEYWORDS: Artificial Intelligence, Cyber Defence,Battlefield,Warfare

I. INTRODUCTION

Artificial intelligence (AI), also known as machine intelligence, is a branch of computer science that aims to imbue software which has the ability to analyze its environment by using predetermined rules and search algorithms, or pattern recognizing machine learning models, and make decisions based on those analyses.AI can be gainfully employed to enhance future capabilities in following ways:

1.Intelligent and autonomous unmanned systems

2.AI-enabled data analysis

3.Information processing and intelligence analysis

4.Wargaming, simulationand training

5.Defence, offense, and command information warfare

6.Intelligent support to command decision-making [1]

From the military perspective Artificial intelligence is not a weapon is an enabler, like electricity and combustion engine.Thus, its effect on military power and international conflict will depend on particular AI applications and for militaries and policymakers. The AI's potential promise is, to improve the speed and accuracy of everything from logistics to battlefield planning and to enhance human decision making. AI is driving around the word to accelerate their research and development of AI applications [6]. The arrival of AI could change the character of warfare, from today's "informatized" ways of warfare to future "intelligentized" warfare, where AI will be critical to military power [1].

II. LITERATURE REVIEW

The article proposed by jamesjohnson stated that a new generation of AI-augmented offensive cyber capabilities will amplify the risk of inadvertent escalation posed by the co-mingling of nuclear and strategic (or counterforce) non-nuclear weapons and the increasing speed of warfare, and in turn, increase the risk of nuclear confrontation [1]. The author Gupta kumar stated that AI can be used in the development of intelligent and autonomous weapons systems, military robotics and cruise missiles. Also used in cyber defence and cyber warfare in penetration testing for defensive or offensive purposes [2]. The author stated that the Defence ministries need to develop the internal capabilities to be intelligent customers on AI. However, acquisition is a key component in the development of military capability and if even conservative forecasters are to be given some credibility, the world is just at the beginning of a period of accelerating change in the AI domain. The first stage of the management of a problem is to recognise the precise nature of that problem [3]. The author A. Mishra et al. proposed that the Artificial Intelligence is the key for the approach towards autonomy. And is only possible to make tank

autonomous when we integrate the sensors and actuators to Artificial Intelligence algorithms. Due to this the tanks are smarter hence improving the performance factor of it [4]. The author argued that data-driven decision-making is susceptible to inaccuracies, discriminatory outcomes, embedded and exacerbated bias, and even unintended consequences due to various limitations that occur through the process. Technical research in the field is currently looking at ways in which to meaningfully address these concerns, and policy development must confront the same. The proposed framework attempts to bridge the gap between the two, and develop a shared understanding of these issues. Importantly, it demonstrates that AI systems cannot be thought of as isolated mathematical problems, or as neutral in nature or as only beneficial because of their efficiency. Rather, AI technologies are complex social systems that cannot, and should not, be evaluated only on the basis of efficiency and accuracy [5]. Author said that the consequences of AI for the world are likely exceed the consequences for military power and the future of war. Advances in military applications of AI are the reality, and it can be expected that AI will eventually manifest in all warfare dimensions [6].

III. RELATED WORK

Nowadays Artificial intelligence is rapidly developing and the innovations in the field of defence are increased day by day. Depending on the manner where AI is applied, it can be benefited or harm society, and widen or bridge the gap between protected and non-protected classes [5]. There are various applications of AI as follows:

1.Computational Military Reasoning- Computational military reasoning makes the right battlefield decisions, for solving problems that are faced by humans. It creates a set of orders and acts accordingly on that information by analysing the battlefield.While analysing the battlefield it finds the weaknesses in enemy's position.

2.Intelligent and Autonomous Unmanned Weapon Systems - AI can be used in the development of Intelligent and Autonomous Weapons Systems, including unmanned aerial, surface and underwater vehicles, as well as military robotics and cruise missiles.

3.Cyber Defence and Cyber Warfare – AI can be used to enhance critical military networks and information systems. In cyber warfare Distributed Denial of Service (DDoS) attacks can be detected mitigated using pattern matching, statistical analysis, machine learning and big data analysis [2].

As AI is crucial game changer in military, this militarization trend to increases global catastrophic risk during AI takeoff. Risk include the use of nuclear weapons against rival AIs, and other consequences of a war between two AIs. As a result beneficial AI is may evolve into dangerous military AI [7].

However, autonomous weapons systems, controlled by AI and robots, e.g. lethal autonomous weapons systems (hereafter – LAWS) can be debatable from the ethical point of view. If the decision-making algorithm is comparably simple, and ethical issues are not involved, the task to control the machine is simple for a human operator and reasonably responsible for the decision [8].

IV. CONCLUSION

It is expected that AI will continue to have a significant impact on defence. The Autonomous Defence Vehicle achieves complex military tasks without risking human life. Artificial Intelligencemakes autonomy possible and reliable. The introduction of lethal autonomous weapon systems and the use of AI in military will significantly enhance existing defensive capacities for nations. For many scientist as well as military and policy experts for some time the issue of automating lethal weapons has been a concern.

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