ARTIFICIAL INTELLIGENCE IN GEOPOLITICS

INTRODUCTION

Since the innovation of steam engines and electricity, technology has been evolving rapidly with the most recent to capture the public's attention being generative AI like ChatGPT powered by Large Language Models (Long, 2023). Due to extensive research and developments, technology has matured in modern era where we can accumulate vast amounts of information often termed as "big data", that is too cumbersome for humans to manually process, (Anyoha, 2017). This presents a new challenge to devise means to allow us to understand and utilise this data. Artificial intelligence has proved to be the best solution to processing data efficiently in this era. Artificial Intelligence has already seen its application and utilisation in several industries because of its evolving (wide) range of applications. This includes sectors such as health, education banking, entertainment, manufacturing, eCommerce, and robotics (technology) among others.

Artificial intelligence has also captured the interests of governments upon the realisation of the edge AI can present to their programs and agencies to achieve their goals both nationally and internationally. This has led to the research and development of AI-enabled system to encourage a governments geopolitical strategies and events. According to (Pavel, et al., 2023) the rise or fall of countries will depend on how they effectively leverage and oversee the advancement of artificial intelligence. Artificial intelligence in geopolitics introduces new challenges that involve crucial risks to humanity and therefore, governments will have to construct new regulations to recognise, assess and respond to the potential AI-enabled challenges. This paper dives into the application of AI in geopolitical components concentrating on those believed to attract intensive application of AI-enabled systems namely: Military and defence, economic competitiveness, cyber security and espionage, intelligence and surveillance systems, and geospatial Intelligence.

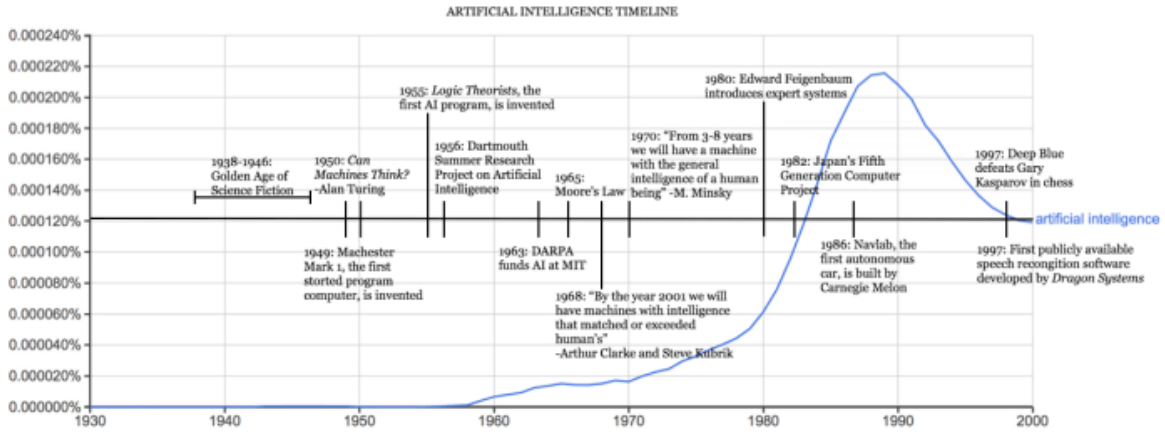
This paper introduces Artificial Intelligence with a brief definition and background. With regarding AI definition there's various ways that AI has been defined in the past but will choose one most relevant to the basis of this paper. This paper also introduces Geopolitics which also has no exact definition and is mostly defined depending on context (Flint, 2006), and with a brief background on geopolitics too. The paper also mentions geopolitical theories that are most relevant to modern era and its these theories that will base our section when exploring the sectors/components of geopolitics that have seen a surge in the research and development of Artificial Intelligence systems. During the research to find work for this paper, RAND Corporation stands out as a reliable publisher for works in technology among countries and a lot of their work was used to compile the contents of the application of AI in geopolitical systems. The military and economic components of geopolitics have experienced the largest amount of investment and attention in relation to AI in geopolitics. United States and China lead with the highest private investments in AI research development with the UK coming in third ahead of all other countries, (Kennedy, 2023).

This Paper also looks at the ethical implications of AI in geopolitical strategies and frameworks where extensively look at the risks and concerns of deploying AI-enabled systems. The use of AI has been criticized, ridiculed, and protested especially in the recent and ongoing Russian invasion of Ukraine, and the use of AI-assisted missiles by Israel in its response to the Hamas terrorist group attacks. Concerns around reliability, accountability, escalation of arms race and privacy many others have been raised, which requires international institution like the United Nations and European to formulate new regulations and laws to provide decide on the acceptable forms of AI.

This paper concludes that AI in geopolitics is essential for a state to enhance their geopolitical strategies. However, it should be strictly regulated and monitored to avoid disaster that can lead to economic disruption, natural disasters, and human fatalities.

What is AI?

We begin this section by defining Artificial Intelligence. According to McKinsey & Company (2024), Artificial Intelligence is defined as the ability to execute the cognitive functions normally associated with the human mind. In 1955 Stanford Professor John McCarthy is quoted to have defined Artificial Intelligence as "the science and engineering of making intelligent machines". The history of Artificial Intelligence can be tracked back further back to Alan Turing in his 1950 work ***"Computing Machinery and Intelligence"*** where he delved into the topic of creating intelligent machines and evaluating their levels of intelligence.



AI timeline. Image by Anyoha, 2017.

What is Geopolitics?

The word (Geopolitics) conjures associations with conflict, imperial expansion and, international negotiations as pointed out by (Flint, 2006). We can define Geopolitics in four ways. However, for this paper we will consider the definition of geopolitics regarding governance and statesmanship. Geopolitics can be defined as "The actions taken, and the channels used to portray these actions in context of strategies related to managing and utilising territories." Geopolitics is linked to the birth of states as prevailing political establishments linked to the end of the nineteenth century a period when powerful states intensively competed between each other (Flint, 2006).

Geopolitical theories

This paper is mainly going to focus on the theories that are mostly considered to be relevant to modern times excluding theories that are believed to be outdated such as Heartlands Theory.

Sea power theory, the methods by which a state projects its military strength onto the oceans. It's assessed in relation to a nation's ability to utilize the oceans despite opposition from rival states/political organisations.

Air power theory, the concept that air power can play a decisive role in warfare by targeting the core of the enemy through the vertical dimension.

World systems theory, a micro-level sociological viewpoint targeted at elucidating the dynamics of the capitalist world economy as an all-encompassing social structure.

Geostrategy, a concept that pertains to the geographic region where a state focuses its endeavours through conducting diplomatic initiatives and military force deployment.

AI applications in Geopolitics

Although AI is still in its adoption phase, it is believed to stand out due to its intrinsic decentralised governance structure and heightened geopolitical attention it has already garnered. Significant political leaders perceive Artificial Intelligence as a technology that holds potential for greater geopolitical significance in comparison to earlier technological developments such as adoption of cloud computing, growth of social media platforms and widespread utilization of smartphones.

These required relatively minimal government intervention for their emergence (Long, 2023). He also goes on to quote Jake Sullivan, a White House National Security Advisor who in a recent address on the topic of Artificial Intelligence (AI) emphasized that maintaining advantage in science and technology is not solely a “domestic issue” or a matter of “national security” but both aspects.

Military and Defence (Military Applications of artificial intelligence)

Since the medieval era, war has always been a last resort strategy in geopolitics when diplomacy fails. States have continuously revamped their military and defence strategies especially after World War II. Military and defence usually account for the largest percentage of a state’s geopolitical strategy budget. With the rapidly increasing tension between superpowers and emerging powers, it has become the interest of many states to apply AI techniques in there military and defence strategies. The United States, China, Russia, Israel, and South Korea are reported to have made significant investments into military AI. In addition, NATO member states (25) are already using autonomous and AI-enabled systems in their militaries, UK Parliament Post (2022). There is various ongoing research and developments in different militaries around in the application of Artificial Intelligence. This is happening in all aspects of military and defence namely: army, air force, navy, space force and other specialised units.

According to Luckenbaugh (2023), in relation to a concept called “Informative advantage”, where soldiers possess the capability to make decisions and take actions more rapidly than their opponents. It is agreed that artificial intelligence is the crucial element for turning this concept into a reality. Military applications of artificial intelligence systems can enhance national security efficiency because automated systems execute tasks faster than humans. Automation featured in militaries include psychical tasks performed by robots and AI algorithms used for analysis to assist in decision making and warfare strategies (UK Parliament Post, 2022). AI systems can be designed with extra capabilities used for many applications. AI-enabled systems have been applied/researched in warfare systems (Automated Defence Systems and Guided missiles), tactical planning, information analysis and research, battle simulations, target recognition, surveillance and threat assessment, cybersecurity, logistic support, medical support and evacuation, and finally autonomous vehicles. These are to benefit militaries in detecting threats and react accordingly, quicker processing of data from drones and satellite images, improve efficiency and reduce human intervention which helps in reducing costs. AI systems will also potentially enhance target accuracy, training, medical assessments, reduction in military costs, access to descriptive data and reduction of military personnel fatalities (SENTIENT Digital, 2023).

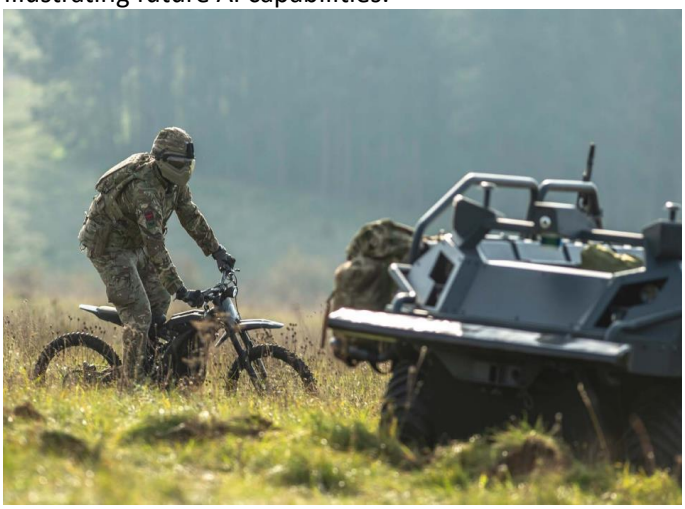
All images are credited to Ministry of Defence. Click here to access full report and images.

Uncrewed pacific 24 Rigid Inflatable Boat by NavyX and BAE Systems.

A multirole uncrewed autonomous vehicle by HORIBU MIRA VIKING

Commandos from the Royal Marine testing a heavy lift drone.

A solider and Mission Master Uncrewed Ground Vehicle illustrating future AI capabilities.



Artificial Intelligence in Cybersecurity and Espionage

The private and public sectors are increasingly focusing on the deployment of artificial intelligence embedded systems in various cybersecurity applications with market estimates expected to grow from US$1 billion in 2016 to US$34.8 by 2025 (Taddeo, et al, 2019). Several governments have explicitly highlighted the inclusion of AI capabilities in their national cybersecurity and defence strategies.

Cyber Espionage is a form of cyber-attack conducted by malicious hackers against governments or businesses. Most of these practices are classified as Advanced Persistent Threat (APT), which is a sophisticated and enduring cyberattack where an intruder infiltrates a network undetected with the primary objective to extract (steal) sensitive data over an extended duration (Baker, 2023). The data acquired can be leveraged by the attacker to gain a competitive edge or be sold for financial gain. Other cyber espionage techniques include Spear-phishing, Zero-day exploits, Watering hole and Insider threat. Since Machine Learning algorithms have the capacity to keep learning, when integrated into a larger political or military strategy, it can germinate into severe consequences such disruption of a nation's public services and critical infrastructure with potential loss of human life. In a Q&A with Paul Proctor, a Vice President Analyst at Gartner, he stated that large-scale distributed denial-of-service (DDoS) attacks, heightened instances of malware, enduring phishing attacks among others as the cyber-threats faced by institutions during Russia's invasion of Ukraine. It can be noted that the realms of geopolitics and cybersecurity have become deeply intertwined (Gartner, 2022).

AI in intelligence and surveillance systems in geopolitics

Nations can use AI-embedded systems to monitor, spy and gather information on their opponents and rivals. This may involve but not limited to using satellites, cameras, and online activity to understand the behaviour and patterns of their opponents or weaker states they intend to manipulate. This intel can be used to determine the weaknesses, strengths, and vulnerability of their intended victim. Governments are always interested in understanding the relationship between a nation's civilians and their ruling regime or administration. This can be achieved primitively by establishing embassies around the world mainly in the nations they are interested in. However, this is insufficient and slow since it requires the involvement of personnel to relocate to these nations to study and learn the behaviours of a nation's people and their relationship with the government. AI-embedded systems have the potential to efficiently do this in a fraction of time compared to the

primitive method. (Mann and Daly, 2020) mention that cross-border access to data is a primary concern in the context of transitional law enforcement. We will look at a case involving the United States of America (US) and European Union (EU). The Court of Justice of the European Union (CJEU) landed its groundbreaking ruling on the implementation of data transfer belonging to EU citizens to the US and the perceived lack of adequate safeguards to protect privacy. This is an indication of the US's strong global surveillance. China has also been accused of using AI-embedded systems to spy on its opponents through mobile applications which led to the 6th of August banning of ByteDance and Tencent by the Donald Trump administration.

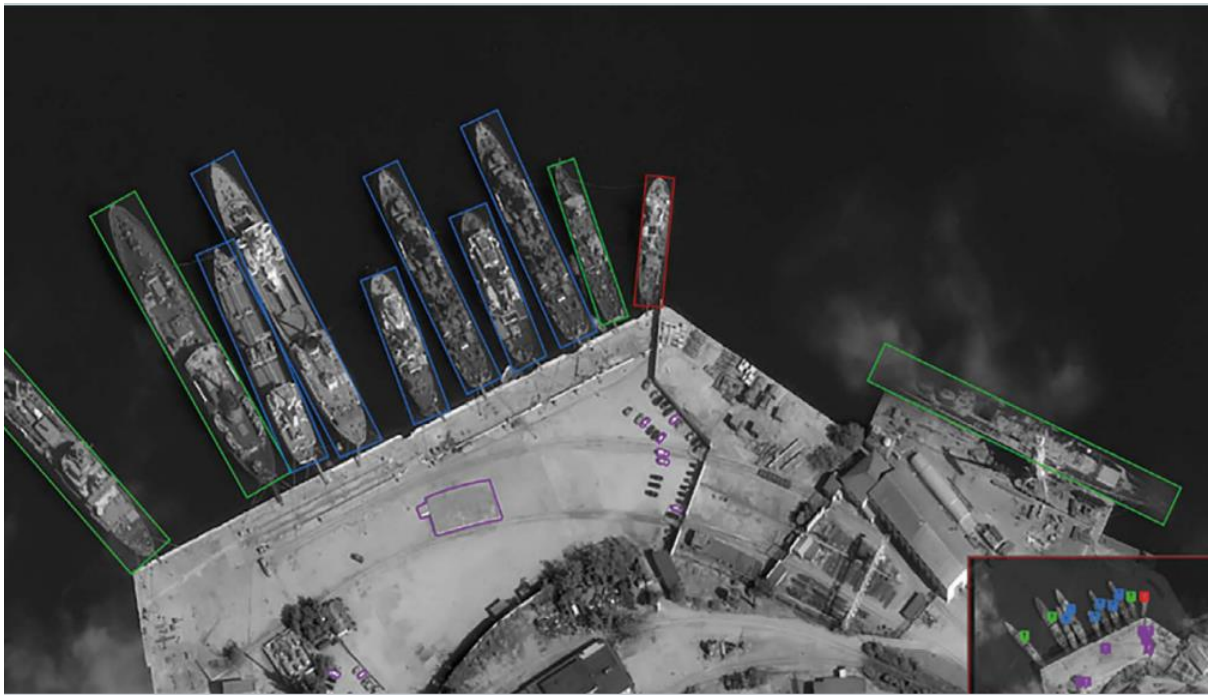


Image is credited to the Ministry of Defence. Click here for full report and image.

Geospatial Intelligence

Geospatial intelligence (GEOINT) defined by Gen. James R. Clapper, encompasses a comprehensive range of elements related to geospatial information and imagery (Spatial data). Spatial data is a dataset of information about specific positions in each space. GEOINT encourages better services through applications that analyse the exact geographical positions of mobile phone users worldwide and this extensively applies to locations of ATM transactions, vehicles, and online behaviours. Governments utilize AI enabled systems (Like Deep Learning) in satellite imagery to tell what things are in their rival's territory which gives them an edge over opponents and a basis to formulate strategies. GEOINT also enables states recognise correlations and connections among various sets of spatial data, in this case, AI-enabled systems are utilized to predict the likelihood of disease outbreak, natural disasters and national security agency.

Economic competitiveness

Economic competition among countries has intensified in recent times. Emerging powers such as India, Russia, China, and the gulf countries are pushing to create firm positions in their influence in the world market while western powers are in turn evolving to maintain their strong grip on influencing the world market. Chris Hyzy a Chief Investment Officer at Bank of America was quoted to have said that artificial intelligence will transform global economy just as steam engines and electricity did when they first emerged. Countries are now researching and developing AI-enabled systems to generate an economic advantage over their rivals and other territories of interest. Bank of America in an article from 2023 estimated a 19% growth rate for revenue associated with AI systems

to reach in the region of $900 billion by 2026. China and United States are estimated to control about 70% of the global economy by the year 2030. The United States has made the high investment in the AI race (Kennedy, 2023) with an estimated $249 billion investment in artificial intelligence by the private sector giving it a geopolitical advantage to influence the global market. China is second behind with an estimated $95 billion investment and from this analysis we can expect these two countries to be the big players who can dictate the direction of the global economy. Artificial Intelligence is potentially the future of Economic competitiveness and countries will have to adjust their budgets to increase AI investments to establish themselves on the global market.

Table portraying the top 10 ranking of global investments in Artificial Intelligence by startups (Kennedy, 2023).

COUNTRY	AMOUNT INVESTED (USD)	NO. OF STARTUPS
United States	249	4,643
China	95	1,337
UK	18	630
Israel	11	402
Canada	9	341
India	8	296
France	7	338
Germany	7	245
Singapore	5	165
Japan	4	294

ETHICAL/SOCIAL AND LEGAL RISKS OF ARTIFICIAL INTELLIGENCE IN GEOPOLITICS

In Military and Defence

Accountability concerns

The utilization of autonomous weapons results into a gap in accountability. Accountability serves as a deterrent by dissuading harmful actions through credible threats of punitive actions against those responsible, (Morgan, et al., 2020). It ensures that specific actors bear the responsibility of the measures taken to ensure compliance with relevant legal agreements in place association with an action and it also serves as a crucial moral principle that assigns moral responsibility for any action taken. Critics argue that fully autonomous weapons (also known as Lethal Weapons Systems or killer robots) pose significant issues related to deterrence, legality, ethics, and accountability. They strongly uphold the notion that it is conceptually problematic to attribute legal and moral responsibility to a nonhuman weapon system for its actions.

Information decay, Privacy and Human Rights

Using AI powered systems in the military creates numerous potential threats to individual privacy and human rights. Some critiques have argued that Artificial Intelligence has potential to be a transformative force that enables profound and far-reaching social changes. AI-enabled systems that include but not limited to surveillance and reconnaissance (ISR), facial recognition technology, big data analysis, and persistent intelligence could provide autocratic regimes with the means to manipulate or disorient their citizens. These include surveillance of their populations, censoring content, engaging in fundamental human infringing activity, as well as identifying and targeting dissidents, (Morgan and Boudreaux, 2020).

Operational concerns

Reliability and Trust concerns

According to (Morgan, et al., 2020), these concerns pertain to issues related to insufficient trust in systems and over reliance on them. One challenge is commonly referred to as the "black box" problem which relates to how AI systems arrive at conclusions and generate outputs in manners that are not evident or easily understandable by humans. This is because the intricate nature of AI algorithms makes it challenging to track back through a system's operations and comprehend the rationale behind its outputs. Another linked factor is difficulties of testing and assessing AI-powered systems since they intended for deployment in complex and unorganised settings. Testing in controlled environments or laboratory settings might be inadequate in guaranteeing that AI systems will operate as intended when deployed. Aviation studies have revealed issues related to "automation bias". This happens when human decision-makers ignore contradictory information since they accept a computer-generated solution as authoritative. This bias can have wide-ranging consequences for example, during Operation Iraqi Freedom, operators who reacted rapidly, engaged prematurely, and placed unquestioned trust in the system were identified as a significant contributing factor in a study of incidents of fratricide.

Hazardous Mistakes

The rapid excessive investment in the research and development of AI-enabled systems can result into disaster causing mistakes. An example of this can be the concept of developing a self-reliant AI program. An AI-enabled system could make decisions prematurely especially if it cannot adjust to changes in war environments and mistakenly fail to distinguish between civilians and combatants/threats. Such mistakes can mature into severe repercussion in case of systems failures. Therefore, to avoid hazardous mistakes, AI-enabled systems must be thoroughly and exhaustively tested assess their behaviour in urgent war situations.

Escalation of the arms race among nations.

As nations strive for dominance and influence on the international stage, research outputs of generative AI as a foundation technology have led to competition between countries. This competition is mostly in the realms of military and defence. As war is believed to become hybrid in the future, countries must react quicker in their development of AI war systems to install a quick grip on influence on the international stage. According to (Koutroumpis et al., 2023) China toped the EU and US back in the period between 2012 to 2014 in the number of AI research outputs and India and Japan becoming big plays in this as well. This race in arms can result in deployment of poorly assessed autonomous weapons which could execute attacks with intensity that can escalate conflicts. Since its challenging to assign blame and the possibility of lowering cost in terms of human actors, Army commanders can use this as an advantage to act more aggressively in war (Morgan et al., 2020).

In intelligence and surveillance.

There is unanswered question of whether there's an ethical way one nation can gather data of another nation and not use it in AI systems to gain a political edge. This is mainly a concern of online policing in relation to cross-border data access (Mann and Daly, 2020). AI surveillance gives governmental agencies a window to abuse power. Several countries and most commonly China have applied AI systems in cyber security for defence and public welfare reasons. However, according to (Wiesenthal, 2022) possibility of malicious intent that cannot be left out and it can materialise into AI being used in strategies or ways that do not serve the interests of public and allies. The introduction of biometric bracelets like in Saudi Arabia can be used to monitor and collect information on foreign citizens, this data can be a tool for manipulation tactics.

In Economic competitiveness

Misconceptions, flawed scientific principles and ideology factors are attributed to the United States by the conventional high status (Bergsteiner and Avery, 2011). This is in the aims to promote and expand Anglo/US capitalism. With economic competitiveness comes from mainly the difference in economic ideology. Countries (mainly the US and its allies) have had reports of forcing, persuading, and forcing other countries to conform to the Anglo/US economic ideology. This has led to development of AI-enabled systems by rival countries to detect threats and prepare counter attacks mainly on their stock markets and eCommerce businesses. The use of AI in economic competitiveness for malicious intent erodes integrity among states and yields tensions that could possibly led to war and sanctions disrupting human life.

In Cybersecurity and espionage

Well as countries are researching and developing AI systems to mitigate cyber threats and espionage, it cannot be guaranteed that countries won't use these same technologies to commit crimes themselves against their rivals. We mentioned how trusting AI is challenge, this can be attached to humans too. It is difficult to trust that states will not indulge in cyber espionage as a defence or attack strategy against their rivals. Russia, China, and Iran have already been accused of such practices and it a question whether these crimes will escalate if many countries develop such AI systems.

In Geospatial Intelligence

A lot of geospatial data contains sensitive personal information such as addresses and names which many people want it to remain private. It is expected and recommended that while geospatial data is collected, states and researchers need to conform to the laws guidelines on using spatial data. However, due to competition and intentions to manipulate rival countries, countries may gain malicious intentions in the aim of disrupting their rival states. Malicious use of spatial data can lead to severe fatalities and economic nightmares.

CONCLUSION

It is evident from the research executed to present this paper that Artificial Intelligence in Geopolitics has great potential to enhance a nation's geopolitical aims and objectives. While the need to for Artificial Intelligence dominance intensifies the rivalries between nations, it can give a nation an edge over its rivals to better prepare and plan strategies to achieve a state's geopolitical aims and objectives. Artificial intelligence can enable militaries around the world overcome a great percentage of their geopolitical challenges. With artificial intelligence in geopolitics, there is a high likelihood of a more levelled ground for a fair competition among states since it reduces the need for human involvement. A case in point can be to compare two nations like United States of America and The People's Republic of China, the who have a population of 331.9 million and 1.412 billion as of 2021. If we were to base on manpower, China is more likely to be dominant. However, with Artificial Intelligence the playing field is levelled as it becomes a factor of whoever can develop sophisticated AI systems faster, wins.

It should be understood by those who are for Artificial Intelligence in Geopolitics that direct geopolitical risks are heightened by Generative AI due to its capabilities to generate precise deepfakes, propagate disintegration campaigns and execute large cyber-attacks. Governments need to follow international laws and the laws of war to ensure trust, accountability, and fairness. (Etzioni. A, and Etzioni.O, 2017) quote an Oxford University team that warns about the fatal dangers of creating extremely intelligent and autonomous systems. All these applications have to be open for scrutiny considering the secrecy surrounding such developments.

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