

Artificial Intelligence as the New Art of War: An Appraisal

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Abstract

The world has been drastically moved into new arenas by the implementation of new technologies in almost every discipline. One such advancement is Artificial Intelligence. Artificial Intelligence is playing a vital role in the military. The data scientists are designing such algorithms that can help in understanding the minds of individuals by closely analyzing the patterns of their thinking. Such Algorithms include many different approaches to data mining. All these advancements in Artificial Intelligence are assisting military forces in devising strategies that will not only enhance the functioning but will also give proactive ways rather than reactive ways while handling the wars or the threat of wars (Manzotti and Chella, 2018). In the contemporary world of using soft powers as a skill to resolve conflicts, the use of Artificial Intelligence in order to win wars through hearts and minds has been a much-needed concept. Data scientists and psychologists need to collaborate and design new algorithms to make the best use of Artificial Intelligence.

Key Words: AI, Data Mining, Hot Cognition, Theory of Mind, Insurgency, Soft Power, Unarmedwar

Introduction

The boom in the use of Artificial Intelligence in different realms, particularly in the military, has been changed the dynamics of deriving various strategies not only during the war but also in the pre and post-war scenarios. Artificial Intelligence has a very close and relatable relationship with humans, as its core idea is to make machines work like humans. Resolving conflicts with the use of weapons has been an old strategy; now, wars are being won with the help of intellects. Researchers are of the view that such winning has chronic impacts and the winning state, therefore, can have a positive influence on global politics. This paper has explained the amalgamation of advanced technology of Artificial Intelligence with the strategies of winning wars of hearts and minds. Different types of algorithms used by Artificial Intelligence are used by data scientists. All of such algorithms assist the armed forces in chalking out the best strategies by keeping global ethics in consideration (Scheutz, 2011; Darling, 2012; Gunkel, 2018). The challenges faced by AI while providing smart solutions have also been discussed in the final section of the research paper.

The Basics of Artificial Intelligence

Artificial Intelligence (AI) is a term used for machine-based intelligence that ought to act like humans. AI is mostly implemented in machines in the form of robots and other large variety of applications, for instance, computer games, cars, biomedical machines, cybersecurity, databases, and smartphones. The scope of artificial intelligence

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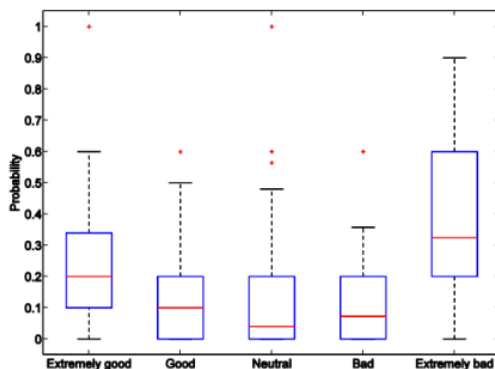
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is very vast, particularly in the field of the military; it has been giving phenomenal services and support to counter a lot of problems as well as providing support to humans from every realm.

It belongs to the branch of 'philosophy of technology'. In the contemporary world of information and technology, there has been massive research going to merge human brain intelligence and that of machine-based intelligence. This amalgamation of intelligence assists in deriving an 'artificial life'. There have been certain questions in this regard. Do a few such questions include can a machine act as a problem solver entity? What are the similarities between human intelligence and that of machine-based intelligence? One most important question could be, can a machine based on artificial intelligence (AI) can have emotions the same as humans do have? Such a series of questions have pushed researchers from different fields to sort out the role and future of AI in all the spheres of life (Kennedy et al., 2017).

Dependency on AI and Accuracy

According to respondents in a 2011 survey, artificial intelligence will achieve 50% of human intelligence around 2050 and 90% around 2150. The most significant contribution to progress will come from industry, the military, and academic institutions. When asked about the likelihood of good and negative outcomes of establishing human-level artificial intelligence, the option "very bad" was given the greatest probability. However, the response "very good" came in second, demonstrating that AI poses both extreme threats and benefits. As represented in the figure.



According to a survey conducted in 2019, 41% of respondents support or strongly support the development of artificial intelligence, while 21% are somewhat or strongly opposed. University graduates exhibit far more support (57 percent) than those with less education.

There are substantial variances in the amount of trust in firms working on artificial intelligence research and management. The most trustworthy sources are university researchers and the US military (50 percent and 49 percent, respectively). In terms of the influence of high-level machine intelligence on society, 22% of respondents believe it will be "on balance terrible," 13% believe it will be "very bad" (possibility of human extinction), 21% believe it will be "on balance beneficial," and 5% believe it will be "very beneficial."

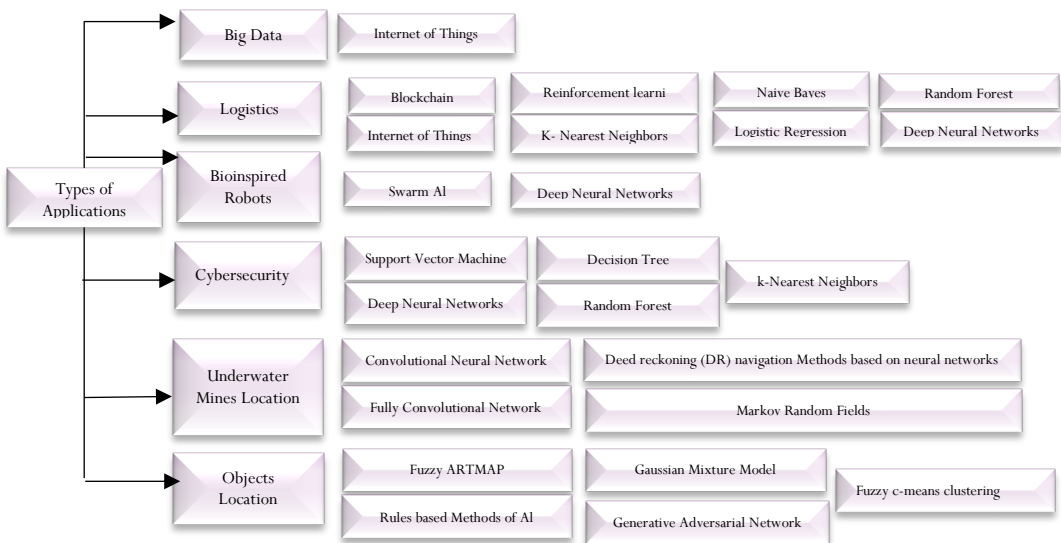
The Notion of Winning Hearts and Minds

This refers to having smart solutions to resolve the ongoing conflicts of wars. There are several strategies that could be adapted in order to solve the insurgencies or resolution an ongoing war. The idea of winning hearts and minds is to play intellectually by focusing on swaying the supporters of the other side of the enemy side. Such strategies not only help to solve the conflicts but also laid a chronic impact on the global political position of the winning side of the state. Even though the warm and welcoming connotations of the term are belied by the actual practice of counter-insurgency, the phrase "winning hearts and minds" (WHAM) captures the extent to which counter-insurgency is viewed as a struggle over public emotions. General Richard Templer coined the concept in Malaya, believing that simply interning villagers to isolate them from rebels was insufficient and that grouping

must also include improving villagers' economic and living situations so that they have a motive to support the government instead of insurgents.

Use of Various Algorithms of Artificial Intelligence and Winning the Hearts and Minds

There are various algorithms of Artificial Intelligence that are used in the military and resolution of different conflicts during the war. These algorithms are designed in order to deal with the various different kinds of conflicts and are very much helpful in coping with difficult situations. As mentioned above that, there is a good ratio of professionals who still believe AI is a source of decision-making and problem-solving technique. These can be very useful in assisting the military as well as giving a long-term analysis in various other spheres. The diagram below manifests many examples of artificial intelligence algorithms that have been used for this purpose. The type of application, along with the name of the algorithm, has been clearly mentioned in the flow chart. For the field of 'big data', AI experts use 'Internet of things'. For 'logistics', experts take usage of some smart algorithms, for instance, K-nearest neighbors, Naïve bayesen, random forest, and deep neural networks. For the robotics experts, use 'swarm AI' and 'neural network'. In the era of computer and information technology, 'cyber security' has been an important area of research of the technology experts. In the field of 'cybersecurity', professionals widely use 'Decision Tree' and many other algorithms. All these algorithms collectively play a vital role in providing strategies to best apply the principles of winning minds and hearts to counter war in the contemporary era of usage of soft skills as a priority in resolving the conflicts among different states.



Artificial Intelligence and the Idea of Winning Hearts and Minds

Along with all the above-mentioned applications of AI, this technology has been used by the military during the warfare of sea, land, and that of information warfare. Moreover, AI has been used widely in the realm of logistics, transport, analysis of armed attack, and exploration of various strategies of warfare. There has been immense usage of artificial intelligence in the defence sector. DARPA (Defense Advanced Research Project Agency) is the department of the United States made to deal with the defense challenges. DARPA has been time and again given certain projects to have research on the future of AI in the sphere of war. DARPA, in its report published in 2017, has focused on the high demand for the use of the basic principles of Artificial Intelligence in the military and focused on exploring and designing the different algorithms of AI.

Artificial Intelligence aims at making all the tools and technology used by the military to be fully automated. As the idea of winning minds and heart states to have a direct impact on the minds of the individuals that are on the other side of the enemy's side. These automated tools will surely help in deciding the fate of the war in a proactive manner rather than the reactive manner. The notion of winning minds and hearts states that the war

must be a win with the help of impacting the enemy's side intellectually as it has been observed that impacting the minds of individuals has a long-term effect and is always the best approach to give a long-term solution to the various conflicts. History has witnessed that the strategy of 'winning through minds and hearts' has impacted the whole fabric of society in the long run. Winning without arms is always recommended, particularly in the post-1948 scenario when there are various human rights portals at the international level and the world has been changed into a global village. Artificial intelligence has very smart algorithms. These algorithms are able to decide about the good and bad sides of a decision in a very precise and timely manner. It assists in deciding the safe and dangerous aspects of a certain decision. It also highlights and helps in deciding when to react and when to wait for the reaction. As a whole, artificial intelligence has been playing a very major role in taking very crucial as well as very important decisions during the war and post-war scenarios. With the new advancements in technology, AI has been expanded by designing a variety of new algorithms and is affecting all the processes in the military (Kennedy et al., 2017). Therefore, AI is helping to take some very important decisions and eventually is affecting all the citizens.

Many states are using AI and are implementing AI in many of the significant events so that they could highly depend on AI when it comes to the military and during insurgencies and wars. In an instance in Russia in 2017, there was software based on AI called 'Alice' that was used as a nominee against their president Vladimir Putin. The virtual assistance of this software was designed by 'Yandex'. This could work all around the clock 24/7, being a machine and was able to take decisions in a very rational way without involving any emotions. The decision from 'Alice' was purely based on logic, and therefore, the accuracy was higher than the human-based decisions. If such a role can be played by Artificial Intelligences, there is a higher probability that AI can play an important role in winning hearts and minds during conflict resolution.

Artificial intelligence not only helps in taking important decisions and providing problem-solving techniques, but it also helps a lot in forecasting the future and provides important data and information. During the ongoing war, AI can provide important data and facts, and by the graphical representation of such data, one can easily assess the future and as well as the best solution to resolve the conflicts and that in a very timely and precise way. Artificial Intelligence is having the attributes of the human brain; to win the war through minds and hearts requires more of the brain than weapons. It is clearly manifested that the use of AI and its algorithms plays a very important role in countering wars of minds and hearts (Scheutz, 2011; Darling, 2012; Gunkel, 2018).

Researchers and data scientists are pouring in their maximum efforts in bringing trust and transparency in Artificial Intelligence based technology. Explainable Artificial Intelligence (XAI) has been a new trend in the field of AI when the focus is increasing trust and that transparency. The more the probability of trust and transparency, the more we can rely on AI as a technology to be used in order to resolve conflicts by playing with the minds and hearts. The algorithms designed in Artificial Intelligence are mostly designed by maintaining the key attributes of the human brain. For example, the algorithms like neural networks, decision-tree, fuzzy logic, K-nearest neighbors, and much more all manifest the thinking process the same as that of a human brain. When AI is all about functioning in the perspective of the human brain, it is obvious of making the best use of AI during insurgencies and wars, particularly in order to win the war by use of intellect and not that of weapon.

The post-1990 era has been called the era of using 'soft power' in resolving conflicts among states. States now have moulded their foreign policies in having non-military strategies to shape their international relations (Manzotti and Chella, 2018). Different aspects of soft powers state that wars and conflicts can be resolved without the use of weapons and force.

The dependency of humans on machines is a fact, and it has already changed the way people work. As technological advancement accelerates, some people, perhaps even a large number of people, may be left behind. There has never been a better moment to be a worker with specialized talents or the appropriate education, as these individuals can leverage technology to generate and capture value. However, there has never been a worse moment to be a worker with only 'ordinary skills and talents to give because computers, robots, and other digital technologies are rapidly acquiring these qualities (Brynjolfsson and McAfee, 2014). As technology advances, so are artificial intelligence. Likewise, Artificial Intelligence has changed the way of military carrying out its tasks and has changed the pattern of designing strategies in resolving conflicts. The focus is now more on winning the wars without the use of weapons and military force. The military forces are now recruiting technological experts

to enhance their technological skills. To adapt to the best technology and for the implementation of advanced technology like Artificial Intelligence, the armed forces are now giving formal training to make the individuals learn advanced technological skills. In the contemporary world, armed forces cannot survive without incorporating technological advancements into their strategies, and there is a dire need of changing their strategies and working mechanisms. There are many advancements in the field of information and technology, and so are the changing dynamics of playing in a war field. Artificial intelligence will become a need in settling various conflicts when the focus is purely on winning with hearts and minds and not with weapons.

Artificial Intelligence, the Requisite to Win Wars as a Non-Military Stance

In the modern world of when advancements have been done at a very large pace, Artificial Intelligence has become an essential requisite in all the spheres of life. Particularly in the sphere of the military AI has been a very significant technological advancement; the armed forces of all the developed states are making the best use of Artificial Intelligence in carrying out their routine operations as well as in chalking out their long term strategies. There could be certain strategies to adapt in the quest of winning wars while targeting the intellect of the other side individuals. A few areas stated below:

Fear-Inducing Domination

Fear-inducing domination is such a strategy that pours in a certain kind of fear in the social fabric of the other side's society. Before inducing such kind of fear, it is incumbent to closely observe the weak areas of that society, and after such analysis, that particular weakness must be compared with the other weaknesses. The one with the highest probability should be used to induce fear. All such analysis is efficiently performed by various algorithms designed by data scientists in Artificial Intelligence. AI will use the data collected from multiple resources in order to give an explicit representation of all the facts and will provide the fear with the highest probability, which could be further used to enhance the chances of winning.

'Emotional-Management' Via Artificial Intelligence

Winning war with the mind and heart is all the game of emotional management. This emotional management can be done with the patterns and algorithms AI provides. Importantly, various Artificial Intelligence techniques have the ability to not only forecast a person's future behavior but also to explain observed behavior, tying appearance and essence together in a way (Kennedy et al., 2017). All these are major contributors to managing the emotions of the desired group of individuals.

Hot Cognition

Hot cognition is a motivated reasoning theory in which a person's thinking is influenced by their mood. Simply put, hot cognition is cognition tinged with emotion. This concept can be used in designing such algorithms in AI that could observe and analyze the emotions of individuals in a very organized way.

Providing the Better Solution

AI has the ability to sort out the one best solution among the multiple solutions. In this way, the solution to conflicts can be possible in a perfect way. In the domain of war and the military, risk cannot be taken while deriving the solutions to ongoing conflicts. Artificial intelligence in this regard plays a vital role in choosing one best and perfect solution among an array of solutions and that in very little time. The logic behind certain algorithms of Artificial Intelligence helps in giving the best solution in a very precise and smart way. The best use of technology in dealing with complex scenarios is often seen in the armed forces. Many practical applications of Artificial Intelligence have already been seen in different departments of military forces. At each level, armed forces are making the best usage of Artificial Intelligence.

Machine Learning and Unsupervised Learning

When given raw data x_1, \dots, x_n , the machine tries to find useful knowledge or information. There is no function

that must be learned in conjunction with the input. The idea is that the machine will assist in the discovery of interesting patterns and information hidden in the data. Data mining is one application of unsupervised learning, in which large amounts of data are combined for interesting information (Reggia et al., 2015). Such interesting techniques like 'data mining is a vast area of research in the realm of AI. It is very helpful in designing various patterns with the help of historical data and is always used by data scientists in creating many new algorithms. As AI provides a variety of algorithms, therefore they can always be customized according to need. During the complicated scenario of winning wars with the help of minds and hearts, there is always a dire need of studying and observing the patterns of how the individuals on the other side are thinking and how they react in certain environments and to certain events. This study not only provides the required data but also helps in sorting out the targeted action to be taken.

AI being a Manifestation of Human Intelligence

Is it possible to build a machine that can solve all of the problems that humans solve with intelligence? This question determines the scope of what machines may be able to do in the future and directs AI research. It focuses solely on machine behavior, ignoring issues of interest to psychologists, cognitive scientists, and philosophers; to answer this question, it makes no difference whether a machine is truly thinking (as a person does) or simply acting as if it is thinking. This provides a hope that machines can learn emotions and can assess the minds, and could help in wars.

Theory of Mind, AI, and Resolving Conflicts Intellectually

Theory of Mind is an important part of social cognition (Baron-Cohen, 1995). The word refers to the set of processes and activities of the human mind that allow an individual to assign mental states to others in cognitive psychology. For example, I may determine that 'John is hungry' by watching him check the contents of the refrigerator. Theory of mind, we argue, must be integrated into intelligent robots if they are to coexist in environments designed by humans for humans. In such a scenario, there has been a wide scope for researchers and computer scientists to amalgamate such theories with the military so that the new trend of winning wars with minds can be efficiently done.

As scientists have sorted out that Internal simulation does allow humans to forecast the mental states and behavior of others by predicting how they would act in a certain situation. Other well-known mental functions that use simulations include episodic and autobiographical memory, counterfactual thinking, and future episodic thinking (Manzotti and Chella, 2018). This is what is needed in the conflicts and when the military forces want to assess the minds of the other side individuals.

Internal simulation is closely linked to empathy as a mechanism that allows us to better comprehend others, which is a direct relationship to the concept of hot cognition. Mirror neurons, which are active both when an individual does an activity and when they witness someone else perform the same activity, seem to facilitate this mental function (Gallese & Goldman, 1998). Another crucial process is humans categorizing other people into 'stereotypical' groups based on broad personality features in order to predict what they would do. The medial prefrontal cortex's ventral and dorsal regions specialize in responding to components associated with the 'self and the 'other,' and their activation patterns appear to alter depending on who is executing the activity we watch. Such many other concepts and theories of AI are a big hope when we want to resolve conflict without using the weapons and when the military only wants to play with the intellect of the individuals of the other side. Contributing to the development of AI is important for people in the armed forces. The need of the hour is to use combined, ground-breaking, and cross-disciplinary testing to directly compare machine-generated mental state attributions with human predictions in order to generate accuracy, which is required while sorting out the conflicts in a very intellectual way. This will not only improve human-machine interaction in all other fields, notably in the field of resolving conflicts in the military, but it will also help to promote much-needed professional applications of AI. Such algorithms of Artificial intelligence help a lot in dealing with the basic need of reading and analyzing the minds of the enemy, which in the result is the core essence of having a war of minds and hearts with the other side of the individuals or the enemy state.

Possible Challenges Faced by AI and the Weapon free Wars

The first and foremost challenge is that either there is machine learning which is mostly supervised learning or that of unsupervised learning, there are always certain limitations. These limitations are inevitable. Machines cannot work as accurately and as expected as the human brain does. That is why the pace in the advancements of Artificial Intelligence is not as fast in the case of other technologies. This has also affected its functioning in the military (Reggia et al., 2015). There are certain morals and principles the world is following while dealing with the conflicts and during the process of sorting out solutions to different problems during the war and in normal circumstances as well. Machines find it difficult to learn this set of moral principles, which may often be very common. We can still not totally depend on technology or Artificial intelligence in taking all important decisions; machine errors are always there. There could be errors in algorithms or in the hardware part of the machine. These errors sometimes could be unknown even to the programmers. So during war times, when risk cannot be taken, the military cannot completely rely on the system or the machines.

Some concerns must be noted as the military attempts to incorporate AI's performance in certain jobs into its systems. The first is that data must be available to developers. Many AI systems are educated using data that has been tagged by a person or an expert system. Companies that use manual approaches frequently categorize large datasets. Even if these AI flaws were not there, the main area of concern for the military at the moment is adversarial attacks. We must expect that potential enemies will try to deceive or break any AI systems that are available to us. Image-recognition engines and sensors will be fooled. Hackers will aim to elude intrusion-detection systems, and logistical systems will be fed manipulated data in order to choke supply lines with fake demands.

The Wide Picture, AI and Military

Artificial intelligence will undoubtedly play a role in military applications in the future. It may be used in a variety of ways to boost productivity, reduce user workload, and operate faster than humans. Its capabilities and resilience will all be improved by ongoing study, particularly its assisting in handling the days of wars and winning them with hearts and minds. This technology is too important for the military to ignore. Even if we don't accept it, our adversaries will, and we'll need to be able to attack and defeat their AIs (Reggia et al., 2015). We must, however, resist the enticement of this resurgent technology. Placing fragile AI systems in contentious domains and entrusting them with key judgments can lead to devastating outcomes. Humans must remain in charge of major decisions at this time.

Conclusion

Although there is little doubt that AI will play a role in the future of wars around the world, the situation is rapidly shifting in potentially different ways. The defense sector has various uses of AI. One important in this regard is the use of Artificial Intelligence during wars and dealing with the wars in an intellectual way without the use of weapons or arms. Given the high likelihood that our exposed AI systems will be attacked and the current lack of resilience in AI technology, uncontested domains, particularly wars, or one may say intellect wars are the best spheres to invest in military AI. As such, wars include the use of psychological experts and data scientists to sit together. There are very strong algorithms, for instance, neural networks, that are programmed in a very well-defined manner. Such Algorithms provide a push to the researchers that such accurate and much-needed algorithms are the need of the hour (Scheutz, 2011; Darling, 2012; Gunkel, 2018). They must be programmed for the state and particularly for the military in the era of competition. Any state cannot simply turn a blind eye to the ongoing competition of application of Artificial Intelligence. It is, therefore, incumbent on all the developed or the underdeveloped states to allocate funds for the research and programming of such algorithms. The proper use of Artificial Intelligence during wars will move the world into a new chapter of different versions of war, which would be fought with the minds and hearts and not with the weapons and threats. As Prof. Stephen Hawking once said: "The rise of powerful AI will be either the best or the worst thing, ever to happen to humanity".

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