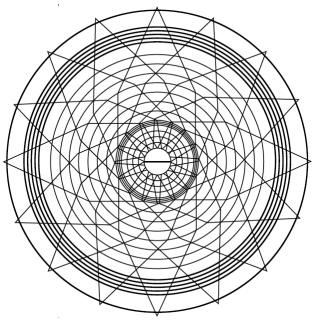


POLITICAL DIMENSION OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Sharikov P.A.
PhD., Senior research fellow, Institute for USA and Canada Studies, Russian Academy of Sciences. Associate professor, School of World Politics, Lomonosov Moscow State University (Moscow, Russia)
pasha.sharikov@gmail.com

Abstract:

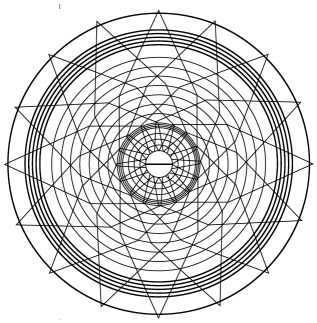
Artificial intelligence (AI) and machine learning technologies have so many different applications that no definition or categorization would be comprehensive. Traditionally business is the driving force for developing new technologies. Some recent developments in information technologies (IT), such as big data, the growth of computational capacity, the speed of information sharing and global digitalization of society, made the amount of information communicated in the world immense.
Political use of AI as a tool of foreign policy in the times of increasing international turbulence may be categorized into two major trends – military and political. Military mostly refers to infrastructural developments, while political is related to cognitive, "human" dimension of artificial intelligence technologies.

Keywords: Artificial Intelligence, Machine Learning, cyberspace, military forces, political sphere

What is AI?

Artificial intelligence (AI) and machine learning technologies have so many different applications that no definition or categorization would be comprehensive. Traditionally business is the driving force for developing new technologies. Some recent developments in information technologies (IT), such as big data, the growth of computational capacity, the speed of information sharing and global digitalization of society, made the amount of information communicated in the world immense.

Shortly after the information revolution of the 1990s, IT became a significant competitive advantage of certain countries, companies. In today's information age, computers are spread pretty much equally among the population. Hence AI technologies are becoming the new competitive advantage.



AI is a unique combination of cognitive and infrastructural technologies. From the point of view of infrastructure, computational capacities have either reached or about to reach a certain limit. Even Gordon Moore, who formulated a famous law that every two years the capacities of the computers will double, admitted that today this trend slows down, and development of computer technologies turns into a different direction. The development of computers in the second half of the XXth century was defined by high demand for communication. When the amount of information transmitted through the Internet started to exceed the capabilities of human brains, the cognitive element of computers became demanding. This is why AI and machine learning technologies became so valuable. These technologies are designed to present users processed information; that is why they are programmed to learn first and to perform certain operations with information in a smart way.

Political use of AI as a tool of foreign policy in the times of increasing international turbulence may also be categorized into two major trends – military and political. Military mostly refers to infrastructural developments, while political is related to cognitive, "human" dimension of artificial intelligence technologies.

There are many examples of AI application in business. Mckinsey Global Institute tried to observe the possible applications of AI in business [McKinsey Global Institute, 2018]. Along with that – it is notable that AI roots in business applications, but the governments have also tried to use AI technologies for their purposes.

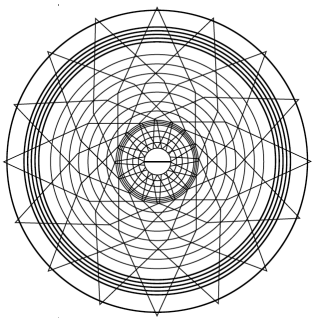
In this context, AI becomes not just the way to win economic competition, but to obtain major political, or even military advantage. People around the world may still experience human – computer interface, but now – there is a new problem, computer to computer interface.

The article tries to observe the major fields of political and military use of AI and machine learning, mostly in the United States of America, because the US is more advanced technologically, and plays a significant role in contemporary international relations.

Military dimension of Artificial Intelligence

The spectrum of instruments used by nations today for international power is vast. Military strategist Carl von Clausewitz defined war as "an act of violence to compel our opponent to fulfill our will" [von Clausewitz, 2018]. In other words, war is a way to achieve political goals through violence. Taking into consideration the new political opportunities, the changing political priorities, the role of national military forces is also changing. Large scale military conflicts become a less and less feasible way to achieve political goals.

In this context, technology becomes a significant national advantage. The technological policy has become a top national political priority in all countries, especially in the most economically advanced. The spectrum of using civilian and (or) military technologies for achieving political goals is very wide. It is quite common that the military use commercial technologies, including those related to artificial



intelligence. American researchers Daniel Hoadley and Nathan Lucas suggested a number of most popular applications of AI technologies in the military [Hoadley & Lucas, 2018].

Intelligence, Surveillance, and Reconnaissance (ISR)

ISR is one of the most important elements of the decision-making process. New technical solutions allowed gathering much more information and data, new sources of information appeared. More precise information about the environment, about the possible and evident opponents, raises awareness, provides more information and data for a most accurate decision. Artificial intelligence technology is especially necessary to analyze huge volumes of information, that the human brain is incapable of dealing with. Modern level of development of computation power allows analyzing big data, and the speed of communication allow to store it on a remote location, including clouds. These technologies may be used on the battlefield, as well as during peacetime.

Logistics

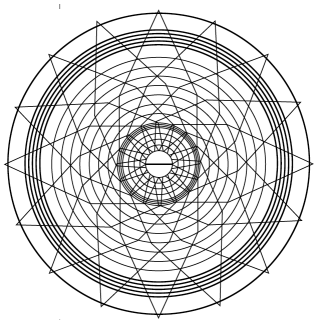
Today some nations have to deploy military forces worldwide. Those military forces which are located in different part of the Globe vitally need a reliable logistical system. Torben Schütz and Zoe Stanley-Lockman compare such sophisticated military logistics to a "nervous system". They point out that "creating a 'nervous system' for military logistics – one with a central location to send signals when in- spections are needed or precisely which parts require repair – allows a unit to operate more effectively due to more complete data links between systems and disaggregated forces" [Schutz & Stanley-Lockman, 2017]. AI technologies may be needed to diagnose and, in some cases, make some remote repair.

Cyberspace

The ability to hit communication infrastructure through hacking, viruses, trojan horses and other forms of malicious software may be very harmful. Traditional means of securing the networks, such as firewalls, are always behind the new technologies. Scott Rosenberg states, that "conventional cyber-defense tools look for historical matches to previous malicious code, so hackers only have to modify small portions of that code to circumvent this defense. AI cyber- defense tools are trained to recognize changes to patterns of behavior in a network and detect anomalies, presenting a more comprehensive barrier to previously unobserved attack methods" [Rosenberg, 2017]. Machine-learning software, such as bots, may be used for exploring vulnerabilities in real time, and vice-versa – fixing them.

Command and Control

Command and Control systems are the brain of every military operation. Along with the development of military technologies and military forces, the nature of operations and tasks has changed. The most advanced military forces of today's most powerful nations deploy weapons and have military units, acting in all possible domains – land, air, sea, space, and cyberspace. A successful military mission would require accurate communication between units among all of those domains. It is interesting that the communication between humans becomes as important as



communication between human and a machine. This is a severe challenge for traditional command and control systems. Colin Clark mentions that the American military forces are developing a "common operating picture," to perform the collected information in the most convenient way for the top decision makers.

Autonomous Vehicles

While many of the technologies described above are still in the early stages of development, autonomous vehicles are currently being tested and already deployed. Autonomous vehicles designed for surveillance, transportation, and even offense may be used on land, in air and sea. For example, in 2015 Google reported that drone swarms might replace humans on the battlefield. "To that end, the US government is now looking towards unmanned aerial systems or vehicles (UAS / UAV), with multiple nano drones flying in swarms in order to gather large amounts of intelligence quickly and effectively without putting humans at risk" [Russon, 2015].

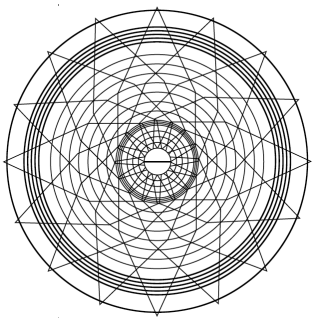
Lethal Autonomous Weapon Systems (LAWS)

The most dangerous application of Artificial intelligence and Machine-learning technologies are Lethal Autonomous Weapon Systems (LAWS). "LAWS are a special class of AI systems capable of independently identifying a target and employing an onboard weapon system to engage and destroy it with no human interaction. LAWS require a computer vision system and advanced machine learning algorithms to classify an object as hostile, make an engagement decision, and guide a weapon to the target. At the moment, DOD has delayed LAWS development indefinitely on moral grounds, which are codified in regulatory limitations" [Hoadley & Lucas, 2018]. The most dangerous application of AI is to rely on machine learned decision-making – on operational, tactical and of course strategic levels. This raises many ethical, legal and other questions, and transforms the nature of war.

The political dimension of Artificial Intelligence

One of the most notable trends of contemporary political development is globalization. The speed, quality, and quantity of international relations have increased significantly. This process started with the Age of Discovery, but in the second half of the XX century, the internationalization has reached the new level along with the new forms of communication. The world wide web created an opportunity to share pretty much all kinds of digital information in real time.

Another interesting social phenomenon that has attracted the attention of many researchers is the impact of the information revolution upon individual empowerment. In the NIC report "Global Trends 2030", the experts from the National Intelligence Council argued that: "…on the one hand, we see the potential for the greater individual initiative as key to solving the mounting global challenges over the next 15-20 years. On the other hand, in a tectonic shift, individuals and small groups will have greater access to lethal and disruptive technologies (particularly precision-strike capabilities, cyber instruments, and bioterror weaponry), enabling them to perpetrate large-scale violence—a capability formerly the monopoly of states" [Global Trends 2030, 2012].



Individual empowerment has a direct influence on politics because it requires fundamentally new approaches to governance. Along with globalization, individual empowerment, a growing number of non-state actors, the national governments have lost the monopoly on defining the national interests and in some sense conducting foreign policy. Such traditional notions as national sovereignty are now being reinterpreted.

The contemporary idea of sovereignty includes not only traditional elements, such as territory, population, and authority, but also the unity of the nation and the general support of the public for the temporary government. According to Academician Andrey Kokoshin, "real sovereignty implies the stability of the political system, national unity, lack of fundamental controversies between the authorities, civil society, business, and intellectual elite" [Kokoshin, 2006: 26]. This is where public opinion becomes a vital element of politics.

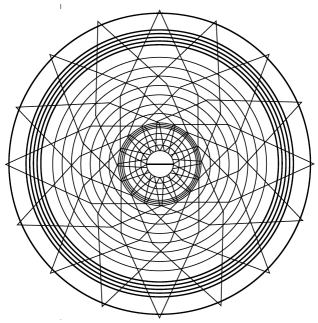
There are many different ways to achieve real sovereignty through technologies and AI in particular. One of the most dramatic examples in today's world is the so-called system of social credit [Ma, 2018], introduced in some Chinese provinces in the 2010s. A government-controlled artificial intelligence technology monitors the lives of the citizens, and rates every individual according to a compliance scale. Those who receive high ratings get benefits, while those on the bottom do not get access to certain public goods, and may be punished.

While this particular case seems extreme, modern technologies offer plenty of possibilities to affect public opinion and create the illusion of public opinion towards a specific person or a problem. Most concerning is the fact that foreign powers may employ these technologies to create a certain public opinion approach for their personal benefit.

Obviously, some nations have mastered these technologies more than others. Joseph Nye has called this form of international influence "soft power." Reflecting on the nature of power in the 21st century, Joseph Nye stated that "The United States will need a smart power strategy and narrative that stress alliances, institutions, and networks that are responsive to the new context of a global information age" [Nye, 2011].

Probably the most popular consumer-oriented platform for communication is so-called social networks. The term itself was taken from phycology, but in contemporary public, it has certain meaning. Such companies like Facebook, Google, Instagram, Twitter, etc., offer a technical solution for global communication. People can develop their personal networks by sharing different pieces of information online, and get in touch with other people in the world.

Social networking is becoming very popular, not only among the younger generation. According to the dynamics of the number of websites within the national domains, along with the growing popularity of Facebook and other social networks, the number of websites in such domains as .com and some others started to decrease. In the United States and Europe, the number of internet users almost equals the population. Moreover, recent statistics demonstrate that the number of Facebook



users exceeds two-thirds of the population. Modern consumer communication technologies encourage people to use social networks; all modern mobile devices and smartphones offer many solutions for instant social networking.

The popularity of social networks has certain effect on politics and the way the authorities communicate with society. American politics is a perfect example of how social networks became one of the most important instruments of politics. Barack Obama was known to be the first presidential candidate to employ the social network resource in 2008 for engaging younger voters. In the late 2000s in the United States, internet users were mostly younger people. In 2016 Donald Trump successfully used social networks for winning many votes. By 2016 in the United States internet user almost equaled a voter. Besides political preferences, there are also many other different pieces of information, needed for analysis and creating an accurate strategy for creating a public opinion on certain issues.

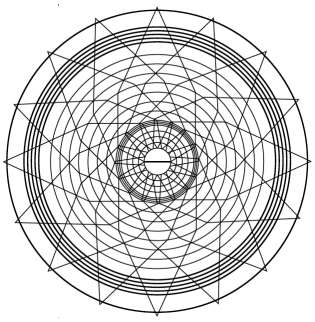
Besides the brilliant internet campaign, Trump's campaign also included certain AI applications. The number of Trump's followers on Facebook exceeded those of Hillary Clinton.

It was widely discussed that the success of Trump's internet campaign also included an AI algorithm that analyzed many different pieces of big data, collected and analyzed by a company called Cambridge Analytica. A company gathered many different pieces of personal data, for analyzing and providing the most accurate political advertisement for every individual user.

Apparently, this strategy worked perfectly for Donald Trump, who managed to gain the required support in most of the swing states.

To a certain extent, these AI applications have provoked many to accuse Russia of interfering with American elections. First, the Senate Intelligence Committee concluded [Report on Russian Active Measures, 2018] that a company named Internet Research Agency (IRA) was massively involved in shaping the US public opinion during the 2016 US presidential campaign and afterward. IRA's head is reported to be very close to the Russian government and President Putin personally. Robert Mueller's indictment of a number of IRA associates proves that the activity of the Agency was aimed at destabilizing the domestic political environment in the United States. Controlled by the Kremlin or not – It is still unclear to what extent the described techniques of targeted social media influence and political advertisement actually affected the election turnout. At the same time, it is obvious that Trump's campaign strategy relied on engaging voters through social networks. The company Brad-Parscale brilliantly exploited this resource for a targeted political advertisement [Ma, 2018]. Moreover, the head of this company is named to be Donald Trump's chief campaign manager for the 2020 elections.

Brookings Institution proved that the very architecture of Facebook actually promotes political polarization . There are also reports that prove that political polarization in the United States is a result of deliberate activities of external factors, such as IRA . While the reason for political polarization is unclear, it is obvious that AI,



as well as information technologies, are becoming an effective instrument for the domestic and international political rivalry.

Conclusions

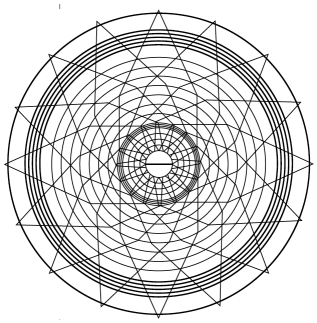
Internet, information technologies, social networks, artificial intelligence, machine-learning technologies, and other contemporary technological solutions are becoming new instruments in the political domain. Governments, nations, non-state actors are currently exploring the new ways of using these new opportunities for pursuing their interests. The most advanced technologies, such as AI are becoming a subject for new competition. As a military application, these technologies are becoming a new subject of an arms race. As an instrument of a political struggle, these technologies are becoming a subject of new global competition.

AI and machine learning technologies have many different applications yet to be explored. They provide their possessor with significant military and political advantage.

While the exploitation of these technologies is not regulated by any international agreement, the race for AI and technological dominance is very unpredictable. Unlike the nuclear arms race, this one is about reaching and maintaining information superiority, an ability to share information faster, larger volumes, and reach the desired consumer. However, along with that probably most important – to analyze information and data.

United States, China and Russia – three countries with the most advanced AI programs, and the most troublesome relations. While the traditional arms control agreements are being destroyed, the world is taking a perilous path for the future.

The governments, even in most advanced countries concede to business enterprises in creating and developing Artificial Intelligence Technologies. It is interesting the Google corporation, one of the most technologically advanced companies in the world suggested the AI principles despite the inability of governments to agree about it. A list of 9 principles was published in the blog of one of Google's administration staff . All 9 principles are devoted to making the AI technology beneficial for society and not harmful. It is interesting the Google refuses to work with the governments and the military for making AI applications for new weapons.



REFERENCES

Global Trends 2030: Alternative Worlds. URL:https://globaltrends2030.files.wordpress.com/2012/11/global-trends-2030-november2012.pdf

Hoadley D. S., Lucas N. J. Artificial Intelligence and National Security. April 26, 2018. Congressional research service report. URL:https://fas.org/sgp/crs/natsec/R45178.pdf

Kokoshin A.A. (2006). Realny suverenitet v sovremennoy miropoliticheskoy sisteme.

Ma A. (2018). China has started ranking citizens with a creepy 'social credit' system URL:https://www.businessinsider.com/china-social-credit-system-punishments-and-rewards-explained-2018-4

McKinsey Global Institute (2018). Notes from the AI Frontier: Insights from Hundreds of Use Cases. URL:https://www.mckinsey.com/~/media/mckinsey/featured%20insights/artificial%20intelligence/notes%20from%20the%20ai%20frontier%20applications%20and%20value%20of%20deep%20learning/notes-from-the-ai-frontier-insights-from-hundreds-of-use-cases-discussion-paper.ashx

Nye, Joseph S. Jr. 2011 The Future of Power. p.234.

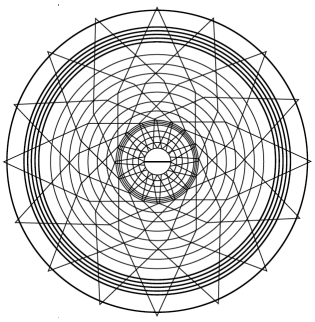
Report on Russian Active Measures. House Permanent Select Committee on Intelligence. March 22, 2018. URL:https://republicans-intelligence.house.gov/uploadedfiles/final_russia_investigation_report.pdf

Rosenberg S, “Firewalls Don’t Stop Hackers, AI Might,” Wired, August 27, 2017. URL:https://www.wired.com/story/firewalls-dont-stop-hackers-ai-might

Russon M-A., Google robot army and military drone swarms: UAVs may replace people in the theatre of war. April 16, 2015. International business Times. URL:https://www.ibtimes.co.uk/google-robot-army-military-drone-swarms-uavs-may-replace-people-theatre-war-1496615

Schutz T., Stanley-Lockman Z. (2017).Smart logistics for future armed forces. Brief Issue#30. URL:https://www.iss.europa.eu/sites/default/files/EUISSFiles/Brief%2030%20Smart%20logistics.pdf

von Clausewitz C. (2012). On war. Book I – on the nature of war. CreateSpace Independent Publishing Platform.



ПОЛИТИЧЕСКОЕ ИЗМЕРЕНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА И МАШИННОГО ОБУЧЕНИЯ

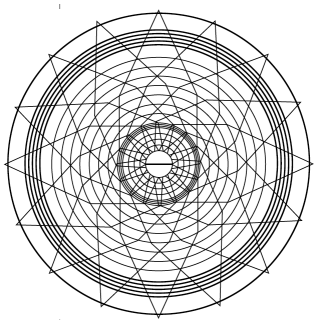
Шариков П. А.
кандидат наук, Старший научный сотрудник, Институт США и Канады, Российская Академия Наук. Преподаватель, Школа Мировой политики, МГУ им. М.В. Ломоносова (Москва, Россия)
pasha.sharikov@gmail.com

Аннотация:

Искусственный интеллект и технологии машинного обучения сейчас имеют столько разносторонних применений, что ни одно определение или категоризация этого явления не будут исчерпывающими. Традиционно именно бизнес является движущей силой для развития новых технологий. Некоторые последние изменения и достижения в сфере информационных технологий (IT), такие как большие данные (Big Data), рост компьютерных мощностей, скорость передачи информации и глобальная цифровизация общества, сделали количество информации, которая передается в процессе коммуникации, огромным.

Автор представленного исследования полагает, что политическое использование искусственного интеллекта как инструмента ведения внешней политики во времена усиления политической турбулентности может быть категоризовано в рамках двух основных трендов - военного и собственно политического. Военное применение в большинстве своем относится к инфраструктурному развитию, в то время как политическое - к когнитивному, "человеческому" измерению технологий искусственного интеллекта. Рассмотрению этих аспектов и процессов и посвящена данная статья

Ключевые слова: искусственный интеллект, машинное обучение, киберпространство, военная сфера, политическая сфера



БИБЛИОГРАФИЯ

Кокошин А. (2006). Реальный суверенитет в современной мирополитической системе. М.: Европа.

Global Trends 2030: Alternative Worlds. URL:https://globaltrends2030.files.wordpress.com/2012/11/global-trends-2030-november2012.pdf

Hoadley D. S., Lucas N. J. Artificial Intelligence and National Security. April 26, 2018. Congressional research service report. URL:https://fas.org/sgp/crs/natsec/R45178.pdf

Ma A. (2018). China has started ranking citizens with a creepy 'social credit' system URL:https://www.businessinsider.com/china-social-credit-system-punishments-and-rewards-explained-2018-4

McKinsey Global Institute (2018). Notes from the AI Frontier: Insights from Hundreds of Use Cases. URL:https://www.mckinsey.com/~/media/mckinsey/featured%20insights/artificial%20intelligence/notes%20from%20the%20ai%20frontier%20applications%20and%20value%20of%20deep%20learning/notes-from-the-ai-frontier-insights-from-hundreds-of-use-cases-discussion-paper.ashx

Nye, Joseph S. Jr. 2011 The Future of Power. p.234.

Report on Russian Active Measures. House Permanent Select Committee on Intelligence. March 22, 2018. URL:https://republicans-intelligence.house.gov/uploadedfiles/final_russia_investigation_report.pdf

Rosenberg S, “Firewalls Don’t Stop Hackers, AI Might,” Wired, August 27, 2017. Retrieved at: https://www.wired.com/story/firewalls-dont-stop-hackers-ai-might on 12.01.2019

Russon M-A., Google robot army and military drone swarms: UAVs may replace people in the theatre of war. April 16, 2015. International business Times. URL:https://www.ibtimes.co.uk/google-robot-army-military-drone-swarms-uavs-may-replace-people-theatre-war-1496615

Schutz T., Stanley-Lockman Z. (2017).Smart logistics for future armed forces. Brief Issue#30. URL:https://www.iss.europa.eu/sites/default/files/EUISSFiles/Brief%2030%20Smart%20logistics.pdf

von Clausewitz C. (2012). On war. Book I – on the nature of war. CreateSpace Independent Publishing Platform.