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Advisory Panel on the Question of Sustainable Development of Artificial Intelligence

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Forum:	Advisory Panel on the Question of Sustainable Development of Artificial Intelligence
Issue:	Regulating autonomous weapons systems
Chair:	Christina Chang

Introduction

Artificial Intelligence (AI) is progressing rapidly and is widely used in different areas including computers systems and machines. AI technologies in the form of Autonomous Weapon Systems (AWS) have been subjected to perform devastating tasks, including the use of micro-drones to target and kill the enemy. The use of these kinds of weapons has been constantly debated and is still a controversial topic today. There are ethical issues concerning the use of AWS, as the potential threat that it might bring to humanity is alarming. Human reasoning is used on the battlefield to determine moral concerns, set goals, and establish peace. The use of AWS would suggest the elimination of the human operator from the battlefield which poses capable threats for AWS to commit crimes against humanities. Furthermore, though AWS pose economic advantages such as the reduced of the cost of personnel during armed conflicts, security advantages, operational advantages, its lowering of the human cost in armed conflicts is capable of escalating and elongating them.

Industries have written the "open letter" in order to oppose the use of AWS, as such technology is capable of impacting severely on the human race. AI is an important piece of technology that may assist the progress of humanity; however, having AI technology installed and designed as weapons would weaken the trust of AI technology to the public. Thus, by inducing the idea that weapons are capable of harming human beings, this raises the question of the regulation of autonomous weapon systems that are capable of killing without human interventions and consideration of human dignity.

Definition of Key Terms

Autonomous Weapon Systems (AWS)

There is currently no internationally recognized definition of AWS. The US Department of Defense defines it as "a weapon system(s) that, once activated, can select and engage targets without further intervention by a human operator." These weapons, specifically Lethal Autonomous Weapon Systems (LAWS), are deadly and potentially unethical: By killing without any human intervention, many innocent

civilians may become targets, thus threatening the principle of human dignity and the fundamental human right to life. Therefore, AWS introduce the question of the standards of the international humanitarian law.

Artificial Intelligence (AI)

Artificial Intelligence is the simulation of human intelligence that is processed by machines, or the creation of computer systems that are capable of performing tasks normally completed by a human. This kind of technology involves the processes of learning (acquiring information), reasoning (the use of rules and information to reach approximate or definite conclusions), and self-correlation. Speech recognition, decision making, and translation are all tasks that are commonly performed using AI technology.

General Overview

Concerns about Autonomous Weapon Systems (AWS)

While AWS may be advantageous to the military, they are extremely dangerous, and they cause potential threats to international security. Both ethical and legal issues should be discussed when regulating these weapon systems. Regulations are crucial to prevent the inappropriate use or development of these weapons, which can escalate war or start new arms races. Therefore, regulations are necessary and should be implemented into current war conventions and weapon conventions.

Ethical Concerns

In the military aspect, AWS is actually a potentially more ethical approach when executing dirty or dull missions as AWS would be more suited for this task, acting as a force multiplier or processing information and data more effectively. However, there is indeed a remarkable number of ethical issues that is and has been questioned, such as the fact that AWS are capable of committing mass murder without human intervention. Moreover, AWS raise the question of whether machines should be allowed to decide or make decisions about life or death. Disregarding the importance of a person's life would mean disregarding mortality and human dignity; thus, these decisions should not be reduced to an algorithm.

In addition, the development of such technology is capable of inducing a new international arms race which would threaten peace and security internationally, thus allowing state actors or non-state actors to point these newly developed weapons at each other. Since these weapons are fully autonomous, the killings and atrocities committed by these machines are not delegated to humans. Thus, laws cannot threaten and punish these machines. Therefore, as these machines are effective in causing violent atrocities and catastrophes, they are also prone to rapidly escalating conflicts as they act in a speedy manner.

Legality

Autonomous weapons do not meet the standards of international humanitarian laws, as the rules stated in the international humanitarian laws apply and address only to those who plan, decide upon, and carry out the attack. Because, a machine does not delegate the responsibility of attacks, in fact, these laws do not act upon them. The International Committee of the Red Cross (ICRC) states that compliance to these laws would require a human operator deciding, and that these legal obligations and responsibilities should not to be held by a machine and cannot be transferred to a machine. A human operator would be required to intervene on the battlefield to fully comply with international humanitarian laws, as to retain a minimum human control of the use of such weapons and decisions to attack.

Security and Governance

Security is another key issue that should be accounted for, as the credibility and accountability of such machines are questionable. These machines are unpredictable considering that they are merely simulations of human intelligence into computer systems that are designed into weapon systems. Additionally, the deployment of fully autonomous weapon systems is likely going to lower the threshold to declare war and initiate conflict, as it reduces casualties of one's own army and also incentives to compromise and find solutions to end the war. The absence of an internationally recognized definition of AWS leads to the danger of developing these weapon systems. The development of AWS is capable of causing an arms race which countries are likely going to spend massive amounts of money to develop these technology. Drawing the lines to the development and usage of AWS is crucial as the overuse and develop of these weapons can threaten humanity. Meaningful human control over critical functions and decisions to murder is extremely important to prevent the disregard of human dignity and mortality.

Timeline of Events

Date	Description of event
2012	The Human Rights Watch (HRW) calls to establish policies and implement regulations on the use and deployment of AWS.
2013	More than 19 countries call on complete ban on such weapon systems including Mexico, Chile, Ecuador, and Cuba.

July 28, 2015

The Open Letter was publicly announced on IJCIA, which the Open Letter is a letter that encourages the convention to establish regulations on such weapon systems, in fact many famous CEOs are signatories to the letter including Elon.

UN Involvement, Relevant Resolutions, Treaties and Events

The United Nations has been planning on fully banning both the development and the use of such threatening weapons as they not only pose threats to human rights and human dignity, but also undermine mortality and induce security issues globally. Although the United Nations has been committed in establishing definitions and frameworks for such weapons, they have not yet accomplished much. Therefore, there is not yet a clear definition of "autonomous weapon systems" that had been recognized by the international community. Certainly, the deployment of such weapon systems does not meet the standards of international humanitarian laws.

- framework of the 1980 United Nations Convention on Certain Conventional Weapons (CCW)
- Protocol I restricts weapons with non-detectable fragments.
- Protocol II restricts landmines, booby traps.
- Protocol III restricts incendiary weapons.
- Protocol IV restricts blinding laser weapons (adopted on October 13, 1995, in Vienna)

Possible Solutions

AWS are extremely dangerous weapons. Hence, regulations and limitations are needed in order to prevent the abuse and overuse of such weapons and the undermining of human dignity. An establishment of an internationally recognized definition and framework of the use of these weapon systems is crucial. Nations have been reluctant on banning these autonomous weapon systems as they benefit their military. The question of regulating autonomous weapon systems is not very well known to the public and these technologies are fairly new to the world. Raising awareness is another approach when thinking of solutions to the issues. The public's understanding of such technologies and weapon systems is limited, likewise, the public does not realize the potential danger of such weapons systems. Having to work with industries is another possible solution to this issue, as this is another medium to raise awareness and encourage governments to ban the use and development of such technologies. Limiting the development of such technologies can be essential as they can restrict inventors from inventing weapons that cause mass destruction.

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Forum: Advisory Panel on the Question of Sustainable Development of Artificial Intelligence

Issue: Addressing the economic implications of weak Artificial Intelligence

Chair: Phillip Wei

Introduction

From history, we know about the Agricultural and Industrial Revolution from late 17th century to 19th century and its vast influence on global economy. What influenced global economy during both time periods was the advancement of technology. Similarly, today in the 21st century, the development of new technology with artificial intelligence is affecting global economy. Since the development of digital computers (1940s), computers could be programmed to perform complex tasks like discovering proofs for mathematical theorems or play chess with great proficiency. Today, many companies utilize AI in their products to increase their efficiency of accomplishing tasks for both corporate and personal use. However, experts have raised concern that AI may have negative economic implications such as mass replacement of jobs that will cause negative consequences. In other words, despite its obvious benefits for the world, it may actually cause more harm than good if not carefully controlled by governments.

Definition of Key Terms

Artificial Intelligence (AI)

Artificial Intelligence (AI) is defined as the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with human beings. Basically, it applies to developing systems provided with the intellectual processes characteristic of humans, which are ability to reason, discover meaning, generalize, or learn from past experience. AI can cover many technological possibilities – anything from machines and robots to pure software programs. At first glance, it may seem that AI is something like those portrayed in Hollywood movies such as the Terminator or Ironman. In reality, AI is deeply incorporated in our everyday surroundings, ranging from smart refrigerators to Apple's SIRI.

Narrow & General AI

In the technological world, AI is currently defined as either narrow or general. Narrow (or weak) AI is only designed to perform one single task. For example, facial recognition software or internet search engines all employ weak AI configured only to specialize in their respective tasks. General (or strong) AI, as opposed to narrow AI, is technology that would be able to perform *multiple* tasks with skills beyond what a normal human being could have.

Luddite Fallacy

The Luddite fallacy states that new technology does not lead to higher overall unemployment in the country. In other words, new technology doesn't destroy jobs - it merely changes the nature of jobs in the economy. In the 19th century, new automated looms meant that clothing could be produced with fewer lower-skilled workers. As a result, a group of English textile workers known as the Luddites violently destroyed the machines, fearing that eventually the machines will force all workers out of jobs. It is a fallacy because those who believe it are neglecting the fact that technology not leading to higher unemployment now doesn't mean that it won't occur 40 or 50 years later.

Automation

Automation is the making and application of technology to supervise and regulate the production and delivery of products and services. It can be applied to a vast variety of professional and consumer products ranging from cardiac monitors to smart refrigerators.

Machine Learning

Machine learning is "a method of data analysis that automates analytical model building." In other words, it is a branch of artificial intelligence based on the idea that machines should be able to learn and adapt through experience. As a result of this learning, these machines will improve at their tasks and gain more experience and learn even more along the way. Despite this positive aspect, machines improving at their tasks could indicate the possibility that they will eventually get better than humans at the same task, meaning that the chances of AI replacing us will increase.

General Overview

Background Information

In 1951 the first AI programs, specifically checkers-playing programs, were created by Christopher Strachey and Dietrich Prinz. Ever since then, AI has been designed and improved for purposes other than entertainment because of the world's changing environment and other technological advances. Scientists today have determined three eras of automation that help classify the types of AI that they predict will be created. The first era occurred during the 19th century: the Industrial Revolution. During this time, machines were introduced that decreased the amount of laborers needed to continue producing products. As people performed more research, more advanced machinery were produced and the idea of having less work became more plausible, which began the second era during the 20th century. With this idea also came the

fear that robots will eventually replace humans in the workplace. Some economists like John Maynard Keynes viewed this positively when they predict that "technological progress might allow a 15-hour workweek, and abundance leisure, by 2030". Obviously others believe that in an era of technological unemployment, "computer scientists and software engineers will invent us out of work" and the total number of jobs will decline steadily and permanently. In the case that AI does replace things like intelligent systems such as airfare pricing to IBM's Watson, then the third era will occur sometime during the 21st century. Luckily, this idea of all jobs disappearing will not occur immediately within the next decade; this end-of-work argument is often dismissed as the "Luddite fallacy". From all that has been said so far, it seems that the most that we can talk about for AI's economic influence is machines in the job industry. However, this idea cannot explain the entire situation about AI as AI revolves around a much broader concept; any computer-based robot or device that can perform actions that we consider "smart" are all considered AI.

Current situation

Although it is not the main aspect on weak AI's economic implications, we cannot dismiss the fact that robots and machines do have economic consequences, both positive and negative. There are three legitimate reasons to why economists are now becoming more worried about the prospect of robots taking over human jobs: loss of labor, spread of non-working men and underemployed youth, and the flexibility of implementing technology. Again, like previously stated, robots' complete takeover of human jobs will not occur anytime soon, but these reasons should be warning signals to governments about its possibility

Loss of human labor

One thing that we can expect to see during a period of technological advancement is the decrease of human labor as the main driving force of a country's economy. There is evidence that indicates such phenomenon is occurring. For example, in the United States a portion of its economic output that is paid out in wages fell steadily since the 1980s and accelerated even more after the Great Recession. There has been many theories trying to explain this phenomenon, but Loukas Karabarbounis and Brent Neiman, economists at the University of Chicago, have estimated that half of the decline is because businesses replaced workers with computers and software: "In 1964, the nation's most valuable company, AT&T, was worth $267 billion in today's dollars and employed 758,611 people. Today's telecommunications giant, Google, is worth $370 billion but has only about 55,000 employees—less than a tenth the size of AT&T's workforce in its heyday."

Increase of non-working men and underemployed youth

Since 2000, the amount of prime-age Americans (25-54 years old) in the workforce has declined, which means that the number of Americans that have a suitable working age either are not working or cannot find a job. A possible explanation for why this is occurring is because technology is reducing the amount of jobs that are best suited for these prime-age Americans (such as manufacturing jobs). Young people just joining the labor force are also having a difficulty finding jobs. For instance, many recent college graduates are "underemployed", meaning that they are employed in jobs that historically do not require a college degree. In other words, most of these people are trying to get higher-paying jobs but supply of those jobs are decreasing and most young people have to resort to those low-paying jobs such as baristas or waiters.

Flexibility of implementing technology

What this idea means is that technology can be easily implemented to replace human workers in times of emergency. This may seem like an objection to the idea that technology will permanently replace huge numbers of workers because new devices, like self-service kiosks, have failed to fully displace their human counterparts, like cashiers. However, when the appropriate time comes, these new machines will be able to quickly replace their human counterparts. For example, in the 1960s and 70s the robotic revolution began, but manufacturing employment kept increasing until 1980 during the economic recessions. Similarly, the personal computer existed in the 1980s but it did not have any effect on office jobs until the 1990s after another economic recession. This comes to further emphasize that it is a possibility that technology will replace human jobs.
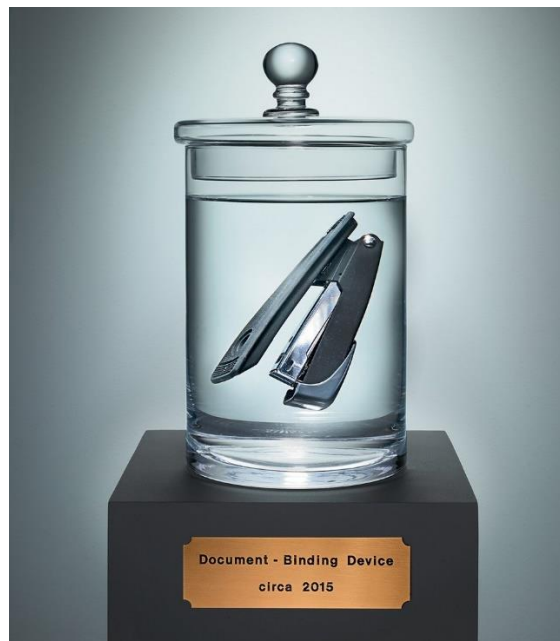
Caption #1: what a stapler could mean to humans in the future

Other implications

There are also other economic implications when we talk about other types of AI instead of just robots and machines. Many of them have to do with the investment that countries and individuals put into R&D for AI and also the development of AI itself. More specifically, researchers have found that private R&D, venture capital, and public R&D all have strong overall effects on economic growth.

Private industry investment

Private investment in AI has been growing rapidly recently and researchers have collected data that such investment provides an increase in income. For instance, in the paper Global Economic Impacts Associated with Artificial Intelligence, the authors state that "the marginal impact of one dollar invested in business R&D is a $1.99 increase in output". Using the same logic, the paper also illustrates that if private investment continues to grow at a linear rate, it will lead to approximately $657.7 billion in economic growth over the next ten years. Thus, this just further emphasizes the potential for AI to have a positive economic effect on the world market in the future.

Venture capital investment

Researchers have discovered that venture capital investment would have the strongest economic effect out of the three types of investment as mentioned. Statistics show that for every input of one dollar of business R&D, venture capital, and public R&D, the effect on their outputs are to be $1.99, $3.33, and $2.69, respectively. Additionally, venture capital investment can also indirectly effect economic growth in many ways such as inspiring innovation, alleviate capital constraints, and encourage further entrepreneurship. For instance, in a study of the 329 metropolitan statistical areas in the US, two economists Samila and Sorenson found that doubling the number of companies receiving venture capital funding "increased the number of firms by between 0.48% and 2.21%, increased the number of jobs by up to 1.24%, and increased aggregate income by between 0.48% and 3.78% five years following the investment". This emphasizes that such investments may even prevent problems such as the permanent losing of jobs that others may worry about.

Timeline of Events

Date	Description of event
November 1951	The first AI program for checkers-playing was designed
1956	The term Artificial Intelligence is first coined by John McCarthy
1956	The first summer AI conference was arranged by the Dartmouth College

1956	The first demonstration of Logic Theorist (another AI program) written by professors from the Carnegie Institute of Technology
June 7-9, 2017	AI for Good Global Summit took place in Geneva, Switzerland
October 11 2017	Joint meeting of ECOSOC and the Second Committee on "The Future of Everything – Sustainable Development in the Age of Rapid Technological Change"

UN Involvement, Relevant Resolutions, Treaties and Events

- UN DESA Frontier Issues Series: The Impact of the Technological Revolution on Labour Markets and Income Distribution

    This document talks about, as its title suggests, the impact that artificial intelligence can bring to labor markets and income distribution. More specifically, it addresses both positive and negative effects of AI on a country's economy and possible scenarios for the coming decade

- AI for Good Global Summit

    This summit is organized by International Telecommunication Union (ITU) and the XPRIZE Foundation as a way for UN and countries to work together to develop solutions that use AI to address specific global challenges related to poverty, hunger, health, education, the environment, and others. Just like other types of summits, this one serves as a communication platform for government officials, UN agencies, NGOs, industry leaders, and AI experts to strengthen dialogue in support of AI invention.

- Joint Meeting of ECOSOC and the Second Committee on "The Future of Everything – Sustainable Development in the Age of Rapid Technological Change"

    In a quick summary, this event is one of the meetings that brings awareness to the topic of AI as a whole. Most importantly, however, is that policy-makers will be focusing on solutions that harness the benefits of AI to the international world while minimizing their unintended, negative consequences, which connects to a crucial concept that is mentioned in the next section.

- The National Artificial Intelligence Research and Development Strategic Plan

    This plan was submitted by US's National Science and Technology Council (NSTC) and the Networking and Information Technology Research and Development Subcommittee. It talks about

how governments will be able identify scientific and technological needs in AI, and to track the progress and maximize the effect of Research & Development (R&D) investments to accomplish those needs. Most importantly, it focuses on both positive and negative long-term economic impacts of AI on society and on the world.

Possible Solutions

One important aspect that delegates need to be aware of is that the influence of technology on economies is not predetermined, but can be controlled by policies at the local, national, and global levels. Thus, governments should be more proactive in their actions towards artificial intelligence and their general policy stance should be to embrace and guide these new technologies instead of trying to block them out due to fear of disruption. In addition, these policies also need to be ensured that the benefits are broadly shared and that workers who might be harmed by it will receive any kinds of support. Essentially, countries should take advantage of all that AI has to offer but also make sure that current labor forces are compensated if unexpected things occur. Moreover, governments' and organizations' perspective on AI should also be something similar to this question: "What new feats might people achieve if they had better thinking machines to assist them?" Bear in mind, though, that this thought process already exists within the UN but the majority of the world that may not have easy access to information could still possibly be trapped in the conventional wisdom that AI will eventually force all human beings out of high-paying and low-paying jobs. Finally, in comparison to other global issues, AI is one of those that is lacking deserved attention because of its capability for influential consequences on the global market. Therefore, another solution that delegates could bring up in their operative clauses could be one that requests the UN to put more emphasis and resources in guiding positive AI development. Obviously, one could simply raise awareness, but it will be much more effective if the UN, international organizations, and countries themselves actually begin physical efforts in this positive guidance in ways such as implementing new policies in their legislature

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