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The evolution of artificial intelligence in the medical field and general purpose

L'évolution de l'intelligence artificielle dans le domaine médical et à des fins générales

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Résumé

Introduction : When it comes to artificial intelligence, the human mind must create intelligent behavior. Just as the human mind is aware of the functionality of artificial intelligence, complex intelligent systems must have some awareness of the human mind, especially when processing information in the medical field. He must be able to learn things in a changing environment and must have the ability to solve problems and provide solutions.

Matérials and method: In this article, we will explore how Artificial Intelligence has evolved over time and how it has been integrated into modern medicine. We will evaluate the impacts of this technology on patients, professionals and health systems as a whole.

Results: We will evaluate the impacts of this technology on patients, professionals and health systems as a whole. The considerations mainly revolve around the question of whether Artificial Intelligence constitutes an effective substitute for certain services or professionals.

Conclusion: The transition of artificial intelligence from complex to intelligent has many implications that range from futuristic technological takeover to machines performing everyday menial tasks

Keywords: Artificial intelligence, Evolution, Medicine, Consciousness, Human mind, Intelligent systems

Abstract

Introduction : En matière d'intelligence artificielle, l'esprit humain doit créer un comportement intelligent. Tout comme l'esprit humain est conscient de la fonctionnalité de l'intelligence artificielle, les systèmes intelligents complexes doivent avoir une certaine conscience de l'esprit humain, en particulier lorsqu'ils traitent des informations dans le domaine médical. Il doit être capable d'apprendre des choses dans un environnement changeant et doit avoir la capacité de résoudre des problèmes et d'apporter des solutions.

Matériels et méthode : Dans cet article, nous explorerons l'évolution de l'intelligence artificielle au fil du temps et son intégration dans la médecine moderne. Nous évaluerons les impacts de cette technologie sur les patients, les professionnels et les systèmes de santé dans leur ensemble.

Résultats : Nous évaluerons les impacts de cette technologie sur les patients, les professionnels et les systèmes de santé dans leur ensemble. Les considérations tournent principalement autour de la question de savoir si l'intelligence artificielle constitue un substitut efficace à certains services ou professionnels.

Conclusion : Le passage de l'intelligence artificielle du complexe à l'intelligent a de nombreuses implications qui vont de la prise de contrôle technologique futuriste aux machines effectuant des tâches quotidiennes banales

Mots-clés : Intelligence artificielle, évolution, médecine, conscience, esprit humain, systèmes intelligents

Introduction

The scientific knowledge recognizes the artificial intenligence [1-30] The importance of artificial intelligence in health and medicine arises from a systematic review that organizes the details of knowledge-based evidence and controversial antitheses to minimize bias. The information sources were obtained from websites; Google, Google Scholar and Harvard University with relevant references.[2,5,11,20,24,30]

We will evaluate the impacts of this technology on patients, professionals and health systems as a whole. Considerations primarily revolve around whether AI is an effective substitute for certain services or professionals. Likewise, we will examine the ability of AI to reduce the workload of healthcare professionals and provide greater efficiency in diagnosis and treatment for a wide range of pathologies. Given the slow progress in the past, many people believe that AI over-promised and under-delivered. To ensure continued funding, expectations for AI were redefined so that anything that was a difficult problem for computers to do was defined as "intelligent." Therefore, AI has often been thought of as the automation of activities that we associate with human thought, activities such as decision-making, problem-solving, learning, and understanding language. If we can specify what knowledge is, then it can be represented using symbols. If we can find a way to manipulate this knowledge so that a computer can use it, then we can reason with this information and automate activities. This automation of logic has been a very productive paradigm for automating certain reasoning tasks, but it has shown only limited success with problems that are poorly defined or lack a definitive mathematical model for knowledge. AI has shown that knowledge automation is a powerful tool for tasks that can be precisely specified, but has not shown anything that could be described as excessively “intelligent”.

Artificial Intelligence, Also called "AI", this technology has gradually infiltrated our daily lives, from the first pocket calculators to today's most complex search engines. The idea of intelligent technology has given rise to many fascinating theories and ideas, but AI is often misunderstood by the general public. The problem is that most people learn about AI through science fiction, which depicts it as human-like robots with the ability to be

sentient, self-aware, and evil. This is far from reality. Today's AI technology is not an intelligent monster waiting to take over the world. The reality of AI is a fairly harmless and extremely useful technology. Currently, the field of AI is still fulfilling its long-standing promise of delivering truly intelligent and adaptive software.

The complete explanation of artificial intelligence

A great example of successful AI is the use of a neural network. In 2001, I was employed by the systems division of a large satellite television company. My task was to use a neural network to improve the routing of satellite transmissions to make better use of available expensive resources. At the time, due to my newness to the field, I was skeptical that a simpler traditional algorithm using things like graphs and trees could have been more effective. However, after collecting data on network usage, I created the neural network, and to my surprise, it outperformed the traditional algorithm. Neural networks are designed to simulate a system in the same way that the human brain would perform a particular task or set of tasks. In this scenario, using the neural network performed better because it was adaptive and learned from the environment, whereas the structure of an algorithm using graphs and trees would not have coped with the variety of changes occurring in the network.

The methods by which AI can be developed and implemented are based on the functions it must perform. These functions can be classified into specific areas, and AI is mainly found in systems that adjust their behavior to their environment or take on certain learning tasks. This is why artificial intelligence would have the capacity to make the computer “intelligent”. . It is worth noting that intelligence in AI is not just limited to learning and problem solving, as there are several systems intended primarily to gather knowledge or provide reasoning. An often overlooked area is that of simulating human intelligence, since it is usually easier to base the system's behavior on something simpler, like a mapping function. Indeed, simulating various human characteristics can be entertaining and also help test theories of human behavior. Finally, AI can be classified in different ways.

Importance of artificial intelligence in daily life

The year 2020 saw us all in a very unique situation in which we all started living and experiencing a new normal due to the COVID-19 pandemic that broke out all over the world. For a virus that does not discriminate, artificial intelligence has been the forerunner in being the most effective combatant in recent months when it comes to diagnosis and prediction. AI has been widely used in medical imaging technology to increase the likelihood of detecting COVID-19 in patients more quickly. A study performed for the COVID-19 medical imaging task on a fixed date with test samples includes 99 x-ray images, 50 COVID-19 positive images, and 49 viral pneumonia images. A convolutional neural network known as COVID-Net, designed and developed for COVID-19 detection, has been shown to be quite proficient in detecting COVID-19 from X-ray images. In the field of statistical prediction, machine learning models designed to predict the progression of COVID-19 have become crucial. The COVID-19 pandemic is an urgent issue; the decisions we make today affect the outcome tomorrow. A good prediction model could simulate the effect of different interventions and provide a projection of how the disease would spread following that intervention. This allows policy makers to assess which intervention produces the best results.

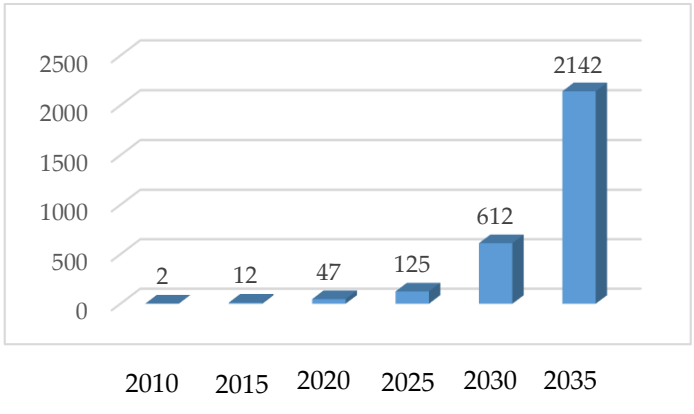
Materials and methods

The main goal of all research conducted was to analyze the progression of AI technology from the inside out, as the scattered literature tends to provide a rather fragmented view of the field as a whole. Here are some of the key points to remember. AI has evolved from a tool focused on imitating human cognition using logic and symbol manipulation to a tool based on probability and learning that is reminiscent of how the human brain actually works. Over the years, AI has become less esoteric to everyday society. Expert systems, while having a profound effect on industries such as finance, are used in the form of Internet-based applications and knowledge-based systems in medical diagnostic software. The most profound change has been the explosive growth of data mining techniques, which now underpin much of the offline and online infrastructure we use, and has driven a huge demand for data mining specialists. Machine learning. In fact, it's likely that the younger generation growing up with online recommendation systems and intelligent personal assistants has never considered AI as

separate from the Internet. AI has largely achieved some of its goals, with much existing software being described as intelligent compared to a human. This level of AI is often incorporated into video games or other forms of entertainment for marketing purposes. For example, the AI has been successful to some extent in simulating human affection and character decision-making. AI is currently thought to have been less successful at scale. Arguably, much of human intelligence depends on the interplay between learning and reasoning and the ability to apply knowledge to a wide variety of tasks. AI's achievements in these areas have only been realized to a limited extent. But the field is still rife with possibilities as technology continues to evolve at an ever-increasing pace. Given the expected growth of the Internet of Things, where AI is set to become a ubiquitous part of our environment, and the current trend towards automation in many professional sectors, it is highly likely that demand in AI technology and AI researchers will continue to increase.

Results

The layman's application of AI provides a tolerable representation of the modern expansion of AI study into the future. The difficulty is that everything the word AI is used on a daily basis works on a smaller scale than the future implies. The study of AI has produced an unusual and stirring change in the design of PC software and hardware tools. In the past, AI demands have been the focus of divergent software and began to mimic the cognitive functions of human beings, which was intentional. AI is a concept designed to augment and simulate human intelligence. Today, wisdom lies in letting the software itself reveal the solutions. The next step is to finish and articulate software problems that only humans can solve.



This figure presents just a sample of the evolution of technology in the field of artificial intelligence according to the annual volume of digital data created on a global scale.

AI in personal assistants and smart devices

Personal assistants are now commonplace. The concept began to gain traction in the early 2000s with the release of Microsoft's Clippy, a paperclip assistant, which could interact with the user in some way. The next big development in this area came with Apple's release of Siri in 2011. This used natural language processing and a certain amount of machine learning to provide personalized responses to user questions. Siri represents the first step towards AI personal assistants and has certainly opened the floodgates for further development.

Perhaps the most influential AI product in recent years has been Alexa's smart speakers. This uses a cloud-based voice service to accomplish a range of tasks from providing information to playing music to controlling other smart devices within the user's home. It uses machine learning to become more familiar with the user's speech and personal preferences and is frequently updated with more AI capabilities. The popularity of Alexa products, coupled with their renowned AI capabilities, has attracted the attention of other companies and sparked an AI race among smart home device makers. This has led to a plethora of similar smart home products, AI-integrated refrigerators, ovens, vacuum cleaners, and more. The cost of these products is extremely high and therefore they are not yet common. However, as with most new technologies, their cost will decrease over time and may even become the standard for household appliances.

Artificial intelligence in medicine

AI in medicine has many applications. It is used as the core of knowledge-based systems to replicate the decision-making of human experts. It is also central for intelligent agents acting on behalf of a doctor or as a tool for interpreting medical data. AI is particularly interesting in the field of medical data. There is a considerable amount of data related to patient records and clinical trials. AI is used to find patterns in data and formulate initial hypotheses that can be tested by a doctor. Intelligent data analysis can lead to early detection of diseases and the ability to understand and track the spread of diseases

within a given population. AI is an effective tool in automating robotics to perform repetitive tasks and precise surgical procedures. AI has proven effective in automating the production and interpretation of medical images. The use of AI has many other applications, and with continued technological advancements, the list will continue to grow. Artificial intelligence (AI) is defined as the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. Currently, much of AI in medicine is designed to help clinicians. The ability to provide quick answers to patient questions has led to the use of AI-guided interviewers. Using AI, software has been developed to simulate an interview with a doctor to obtain a medical diagnosis. One such example is a program called Forward. It has been used to diagnose and treat pediatric ear, nose and throat disorders.

Artificial intelligence in healthcare and medical diagnosis

It is clear that much medical reasoning is a form of decision-making. A logical decision structure is essential for determining the best course of action. In some cases, it is desirable to automate the decision-making process and use intelligent agents or expert systems. These are just a few examples of how AI fits into medical problem solving, and there are many other AI methods that haven't been mentioned. An overly simplistic view of diagnosis is that it involves identifying a set of symptoms with a set of diseases or disorders. In cause-and-effect prediction, the doctor will consider an action such as treatment and predict the outcome, such as whether the patient's health improves, deteriorates, or remains unchanged. This is also common in medicine and is sometimes called analysis of treatment or planning decisions. In this case, the decision maker is often the patient, and this does not necessarily involve only medical staff. Simulation helps predict the effects of different possible actions. Models such as Bayesian networks provide a powerful tool for reasoning under uncertainty and are applied in a variety of ways to medical data. There is great interest in applications of AI in medicine. This area has been particularly fruitful for AI research because medical diagnosis is a complex task that can benefit from the use of probability and decision theory. Additionally, interpreting physiological data such as ECG, X-rays, MRI, and various examinations is a difficult cognitive task. Pattern recognition is also a major part of diagnostics and is a well-established subfield of AI and machine learning. Strong AI is AI that can perform intellectual tasks as well as humans. Weak AI (narrow AI) is AI that can only perform specific tasks as well, or better, than humans. It is the only form of AI that exists today.

According to the World Health Organization, two to four billion cases of disease occur each year and it also says that at least 400 million people do not have access to essential health services. With limited resources and a multitude of patients, AI comes to the rescue. AI programs have been used to explore various biological questions and to help doctors develop and test new methods of diagnosing various health problems. There is already a virtual mammography mentor who helps the doctor interpret mammograms. In the United States, it is also possible to implement AI in mobile robots to help traveling nurses monitor elderly patients. When developing intelligent systems, the choice of medical problem and application area is essential. AI systems must be developed for very specific uses. An illustrative example of AI medicine : computerized drug prescribing. Different types of AI programs are used in medicine. The most basic are data-driven systems that apply intelligent analysis methods to data sets. For example, the National Agenda for Informatics in the United Kingdom emphasizes the electronic storage and sharing of patient records. An AI system would be the method of choice for extracting data to keep in records, and future applications could relate to decisions those records might contain, such as decisions about discharge from hospital treatment. Simulation is increasingly used to help design disease treatment methods. These range from simple abstract mathematical models, such as the one designed in Birmingham to determine the optimal time during chemotherapy cycles to administer a drug that prevents resistance, to more complex simulations of specific organs or the interaction of chemotherapy programs. Agents representing cells. However, the most common types of AI programs currently used in medicine are various expert systems.

Artificial intelligence in education and learning systems

AI technology allows personalization of education to a degree previously unimaginable. Companies like

Carnegie Learning are using AI to provide students with tutors in subjects like algebra and geometry. Tutors can diagnose what a student knows and does not know, provide individualized instruction, review with the student, and manage their learning in limited areas. The system challenges the student at their appropriate ability level, continually building their confidence and knowledge by providing immediate feedback and targeted help. It also increases teacher productivity by automating the grading of certain assignments and providing reports on student progress. AI tutoring with such a degree of personalization has the potential to become a very effective learning tool.

The increased capacity for personalized learning is also apparent with the rise of online courses. AI is often used to provide the student with a custom-generated course aimed at improving their weak areas. One of the first and famous examples of AI in education is the project carried out at CTG UK and the University of Leeds, where an AI software, SHERLOCK, was tasked with delivering a personalized biology course of level A. SHERLOCK was very interactive, conversational and provided immediate feedback. John Dobson explores the evolution of AI in education and concludes that AI has the potential to effectively deliver education to the general public at low cost. Although it is difficult to make a profit in this area, if the process of using AI to automate teaching and tutoring can be perfected, the potential savings are immense. This is extremely important in a global climate where education is increasingly becoming essential to skilled employment.

Objective

The research and analysis conducted in this report will aim to inform and illustrate to the reader that AI technologies have come a long way since the days of expert systems. With the aim of providing information and options that intelligent software development can take advantage of modern AI technologies, I intend to make readers understand that often AI technologies are not so obvious and that a complex system can be simplified through an indirect application of AI technology. For example, a constraint satisfaction problem may have a solution that can simply be found by an intelligent search in the state space of the problem and given the current problem domain.

One of my goals for this thesis is to propose and open an intelligent discussion on the topic of agile software development methodologies in AI technologies in the near future, the potential of exploiting software development assistants AI software and relative success rates compared to current methodologies. The idea of a changing technological world is a scary concept for some and a challenge for others. However, the reality is that to remain competitive, and in some sectors to remain viable, it has become imperative to embrace technology as it emerges. The aim of this thesis is to present a case for AI in everyday software applications, discuss its potential and provide an example of an intelligent software agent. From here, we aim to open an intelligent debate and provide a basis for ongoing research into the implementation of AI technologies in software development, whether directly or indirectly applied to intelligent systems.

First concepts and ideas

The introduction of AI has the sequential importance of starting work in this area. This topic provides information about the AI root. It begins the year of the Dartmouth conference in 1956. It is the first step towards AI research. For this, Dartmouth College in Hanover, New Hampshire, offered a two-month summer research on AI design. Organizers John McCarthy, Marvin Minsky, Nathaniel Rochester and Claude Shannon called the topic “artificial intelligence.” The proposal was that a two-month study of artificial intelligence, led by ten men, would be conducted during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The proposal was accepted and in 1956 they organized a conference that many consider the birth of AI. This meeting also defined the scope of AI as the attempt to build a thinking machine. Then the concept of general problem solver was introduced. List of code names for specific achievements. The organization's accomplishments have far exceeded the intent of the initial plans. Work underway on the ARPANET and various aspects of networking during the 1970s. Then they thought about implementing common sense. So, in 1969, Minsky and Seymour Paper published a book based on the philosophy called “perceptron”.

AI work began shortly after World War II, when English and American scientists came up with the idea of building an electronic brain. This idea was developed in the theory of formal reasoning. This idea was then developed into complex problem solving. In 1950, the first AI program was written by Christopher Strachey. It was also a checkers program, the logic theorist's program was very impressive. Formal representation is encouraged by research on heuristics. In the 1960s, the transition from heuristic research programs to the construction of the general theory of intelligence began. During the development of psychology, cognitive psychology has influenced AI. From now on, AI was now the comparative model of human thinking and problem solving.

Ethical considerations

The area of ethics, especially in the field of AI, has been discussed practically from the beginning. The history of robots and the role of humans in their use raises concerns about the potential dangers that individuals may face in the future due to decision-making AI. So it's worth it for AI researchers to start considering these suggestions now, instead of waiting until a difficult question arises before us. This article officially launched this effort by emphasizing that we should "investigate how to plan AI frameworks that can be relied upon to function morally and that are of benefit to humanity."

Some people worry about the likelihood that machines with larger brains than the population will prematurely end the human race. They can begin to do this discreetly by foiling financial maneuvers that they then take control of circumstances to the detriment of people. On the other hand, they could do this by creating weapons that they could use to threaten nations and force them to submit to them. Care must be taken to avoid these potential outcomes. Unfortunately, this is less demanding said than done. In case there is considerable motivation for a robot to accomplish something, it will discover a path to do it. We must never forget to remain responsible for the machines.

Privacy and data protection

With rapid advancements in the field of artificial intelligence, the protection and security of this developing technology is being called into question. Artificial intelligence, as mentioned earlier, has been primarily used in situations where personal information can be obtained and used for the benefit of the individual. An example of this is Facebook's advertising feature, where it gets your recent search history and shows you ads similar to what you searched for. While this can be helpful in certain situations, it also compromises the individual's security as they become more susceptible to having their information misused. With the use of AI in healthcare settings with programs that help make patient diagnoses and software used to detect emotional speech patterns in the treatment of mental illness, it is evident that it These are private matters where wrongdoing in the use of this information may have consequences. serious consequences. In a study conducted by the American Association for the Advancement of Science, even researchers worry that as AI in medicine becomes more data-driven, its focus will no longer shift from the perspective of patient towards the optimization of algorithms, which could compromise patient privacy. This study was conducted using randomized structured interviews with researchers and people using AI to help them in their patient care work, with no AI on recording methods, thereby reducing software-induced bias. All interviewees, regardless of the nature or funding of the research, expressed some level of concern. This shows that even those who work with AI care about the well-being of their patients and the consequences of possible misuse of the information obtained. It is therefore evident that with the continued development and use of AI in many sensitive areas, data protection and maintaining the privacy of individuals is a major concern that must be addressed.

Bias and fairness in AI algorithms

Machine learning algorithms and artificial intelligence systems can result in undesirable, emergent, and complex behaviors when generalized across an entire population. In other words, the model can behave unpredictably to achieve the desired goal, even to the extent that designers cannot fully anticipate what the model will do. Often this leads to machine behavior that appears highly irrational.

The data, and therefore the predictions, decisions, and automated actions based on that data, are as unbiased as the people who design the model, the sources of the data, and the environment in which it is used. While a human decision about the best course of action to take in a

particular situation is not itself a biased action, there is a risk that the automation of that decision will be biased due to the data used to train the predictive model. An example provided by Leslie Gordon at the Equity Accountability Transparency in Machine Learning (FATML) workshop is using past data on who to give a loan to, to train a model machine learning. There is a realistic goal for lending criteria developed using a potentially biased predictive model to be less biased than the original human decision due to some corrective regulation applied following the understanding that the decision-making process was biased. The unintended consequence, however, is that regulatory intervention shifts the bias unpredictably toward another group. This can lead to a cat-and-mouse scenario, repeatedly trying to correct bias in a suboptimal system.

Job losses and impact on the workforce

Some of the more significant and potentially negative changes will be discussed in this section. Above all, there will be job losses due to automation. This implies that as AI improves, machines will be able to perform tasks that were previously accomplished by a human. An example of this is the agricultural sector where GPS-guided machines carry out sowing and harvesting without a human operator. Another example is in the fast food industry, where machines take orders, and in Japan, where a machine has been invented and is used to perform dental fillings. In all these cases, the machines replace human employment (which represents a great profitability for the employer because the machine only has to be purchased once assuming that it requires little maintenance, that it can operate 24 hours a day, 7 days a week and require no salary or entitlements) and achieve comparable or better results.

This will lead to a displacement of human workers and, ultimately, a shortage of jobs, because the profitability of machines is too great for employers to ignore. The second negative impact to discuss is the deskilling of a profession performed by humans, which can occur after job displacement. One example is the replacement of draftsmen with 3D modeling programs. While this may make the task easier for the person controlling the program and will require less training than its hand-drawn equivalent, an oversupply of people qualified to perform the simpler 3D modeling task may force them to work for a lower salary than the original qualified draftsmen. . A similar event may happen to the person controlling the program, as later incarnations of AI could also make this position obsolete.

Current Limitations of AI Technology

Despite significant advances, AI technology still has certain limitations that hinder its large-scale implementation and effectiveness.

21st century technologies have several limitations. The first concerns the creation of artificial intelligence. Despite what enthusiasts would have us believe, we are no closer to creating artificial intelligence. The amount of data needed to inextricably simulate a human brain could be orders of magnitude greater than that required to sequence a genome. And it could be that the problem isn't just a matter of data collection. We may need new analysis methods to recognize and extract salient features of brain structure and processes. It is difficult to overstate the dormant complexity of the brain, and we are still very far from understanding how the brain gives rise to intelligence. Additionally, we might need hardware that does not currently exist. The parallel architecture of the brain cannot be effectively modeled using the serial architecture of contemporary computers. Although these are all interesting and perhaps feasible problems to solve, I argue that they are necessarily out of the 21st century due to the scale of the undertaking and the still insubstantial progress in research into the nature and the functioning of the human brain. This does not mean that we will not make any progress. In fact, methods developed to try to simulate the brain may well prove useful in a wide range of simpler problems, but it seems unlikely that we will have human-scale AI by then. the end of the century.

Ethical dilemmas in AI development

In recent years, rapid advances in artificial intelligence have brought many benefits and opportunities, but they have also given rise to a range of ethical dilemmas and concerns.

The development of artificial intelligence research is also becoming increasingly double-edged. On the one hand, the benefits of AI are beginning to be felt, with large-scale studies proclaiming its potential to eliminate poverty and disease, and free humanity from repetitive work. While

this could be the case given the continued exponential growth that AI has seen in recent years, it is questionable whether this will be a positive outcome. Arguably, freeing humanity from a large number of repetitive tasks could have the negative effect of depriving many people's lives of meaning. Imagine if a large part of the population were no longer forced to work ; while for some, it would be an opportunity to indulge in more creative and fulfilling activities, for others, it would be a cause of depression and a feeling of uselessness, especially since "work" society is less and less likely to start among the poorest socio-economic groups. Another potential problem is "autonomous weapon systems. "There is a strong financial incentive to develop AI for warfare, and an AI arms race seems likely in the near future. While proponents argue that removing humans from the battlefield could reduce casualties, others fear that giving machines the power to decide who lives and who dies is a slippery slope, leading to an arms race. By AI could be the prelude to a third world war. This is to say nothing of the potential for a Skynet-like scenario, in which the AI determines that the most effective way to win the war is to exterminate the enemy, i.e. all of humanity.

Technological and security risks

Technology and security risks are an important area to consider in the daily use of artificial intelligence. There are a number of clear cases where AI has failed, some with disastrous or dangerous results. Some of the failures were : For example, the failure of the Patriot missile : during the Gulf War, a Patriot missile defense system failed to intercept an incoming Scud missile at Dhahran, Saudi Arabia, on the night of February 25, 1991. The missile was launched from Tel Aviv and was heading towards Dhahran too. It was reported that the Scud missile destroyed a military barracks, killing 28 soldiers. Investigations into the cause of the Patriot's failure determined that the system failed to track the Scud's arrival due to a software flaw. The specific error was identified and a software fix implemented, and the Patriot system continued to have a record of successful engagements on multiple Scud missiles during the latter stages of the war. There were errors in the standards used in representing radar system data, both time and location. The time was represented in tenths of a second as a 24-bit binary number. Location was represented in terms of time elapsed since system startup, in tenths of a second.

Two related errors were made when calculating the difference between the start time and the current time in different places in the software. Since time is represented in tenths of a second, the calculated deviations were sometimes offset by a factor of 10, when used in a context that required a time deviation in seconds. The time an object was detected would be represented by a two-dimensional array index, the first coordinate of which indicated the type of the object, and the second coordinate of which indicated a list of objects with different lifetimes, the second coordinate of this array referred to a structure with information about the tracked object. In the particular piece of code that tracked the Scud missile, the network location to which the tracking routine's pointer was passed was a location twelve seconds too far ahead of the actual Scud missile data, causing an error of 12 seconds in all subsequent tracks. history on the Scud missile.

This error was discovered and corrected on February 25 around 3 p.m. However the Patriot was shut down and restarted before the air raid on Dhahran, and the patch was not reapplied at that time because the operators were unaware that the radar tracking system had to remain continuously locked on the target for a successful interception and incorrectly assumed that restarting the system and tracking the target with radar had been a satisfactory engagement. The 12-second error caused a system-generated identification number for the Scud missile, which was to be used for the duration of the missile's trajectory history, to be stored in the wrong location in memory allocated, resulting in the dissociation of data from the new identifier with a tracking history of a now non-existent object. When the ID number was entered into an ID number subroutine call to get the array location, this resulted in array locations that were also 12 seconds ahead of the actual data, again causing a another 12 second error in all subsequent estimates of the target state and a different ID number for the object and all relating to an earlier instance within 12 seconds.

This pattern of errors continued until the end of the mission. The cause and result of the failed engagement was a divergent identification of the target by the system and a missed launch by the lower level battery.

Future outlook: Perspective

There is still a long distance between the human brain and the most advanced neural network, but the best uses of AI do not require it to mimic the human brain. The best and most powerful applications of AI today are in narrow AI: the use of algorithms to perform specific tasks. What it lacks in versatility, Narrow AI makes up for in its ability to perform a specific task very well. Many consumers fear being tracked by their devices and having their privacy invaded. With monitoring services and data analysis tools constantly improving, this is a legitimate concern. It is estimated that over the next fifteen years the European Union will become a net contributor to global data. A report from the Information Commissioner's Office and Ofcom says the UK is set to move from being a net consumer of data to a net contributor of data in a similar time frame. Given that the aforementioned advancements in monitoring energy systems and infrastructure are driven by the increasing commissioning and availability of energy data, it is logical to say that the next few years will be a period of increased development and implementation of AI in these areas. AI used to manage energy consumption will continue to play a more autonomous role; Eventually, consumers will grant AI systems the power to make decisions about energy spending, with the majority of this transition occurring in 20 to 30 years. As AI systems become more integrated into daily life, automation will see a huge boost in AI development and implementation. At the same time, people are more likely to use AI systems if they are more easily accessible, i.e. stored on a smartphone. Large-scale proliferation of AI running on substandard platforms and servers is expected to continue within 10 to 20 years. This will lead to increased demand for AI experts, as there will be a need to ensure that systems maintain a high level of competence.

Potential advancements in AI technology

The first thing that students of nature everywhere must understand as our new robot overlords fall is that AI is not sentient (some AGI proponents counter, of which we do not we just don't know yet). In contrast, there are many reasons to be concerned about narrow AI, which is the idea of artificial intelligence focused on solving a single problem. The potential benefits of narrow AI range from benign to extremely beneficial. An AI tired of fixing atmospheric science could solve an unresolved discipline, possibly useful regardless of possible ramifications due to lack of sharing of human incentives, and would likely replace humanity after identifying such problems and realizing that This was a less expensive solution. Indeed, he could arrive at a decision in what is called a false head, attempting to solve a specific problem while obtaining substantial knowledge. ML would be the only instance of AI. Effective automation AI could be hugely beneficial by reducing the total number of human work hours needed to maintain quality of life, removing more work, or potentially increasing living standards, giving more time to relax and pursue higher goals. Finally, AI science itself would benefit immensely from the presence of an AI researcher, as they could do a lot of tedious legwork to test theories and debug.

Implications for society and human interaction

Artificial intelligence has many implications for society and human interactions. Rapid technological change can lead to a loss of culture and knowledge that can never be recovered. It is possible that with the rise of intelligent machines, humans will develop a dependence on technology that would be detrimental to the species. If people depend on intelligent machines to do everything for them, their own intelligence could begin to decline. Spending all day interacting with intelligent machines leaves less time for human contact. The less a person interacts with another human being, the less he exercises his ability to communicate with others. As human communication skills begin to deteriorate, the demand for skilled communicators in the job market will decrease.

This will lead to a decline in communication skills globally. Less demand for human communicators could lead to a decline in the birth rate, as a large portion of children are born from relationships formed in the labor market. With fewer new members in society and a declining birth rate, human culture may struggle to survive in a world dominated by intelligent machines. An extremely low birth rate could lead to the near extinction of humanity. This is an extreme example of how the implications of AI on society and human interactions could be potentially harmful, although it serves as a warning of what could go wrong if we don't plan carefully

consider how intelligent machines will integrate into human society.

Predictions about the role of AI in everyday life

Predictions for AI in the future vary from category to category. There are predictions about the technological aspect of AI. In the future, for example, scientists believe that AI will have advanced so much that humans will be able to interact with it as if it were a human itself. It is also expected that beginner AI will slowly but surely be replaced by advanced AI, which could pose a significant threat to the human race. Finally, it is predicted that AI will continue to create super intelligent AI. It is essentially an AI that has surpassed every level of intelligence a human can possess and will be able to improve its own intelligence without the aid of human programming. High levels of superintelligent AI pose a threat to its human creators. All of this could give rise to certain violent or utopian science fiction scenarios. AI will become an integral part of daily human life. With the speed and accuracy with which AI can complete tasks, it will be used to perform a large number of tasks. A notable task is the use of AI in military applications. Thanks to AI's ability to become super intelligent, it will be able to significantly improve current military technologies. One example is the use of drones. Today, drones require human control. With advanced AI, drones could become fully automatic and be much more efficient in accomplishing their missions. This is just one of the cases where AI would be used to increase efficiency and reduce the cost of completing tasks.

Implications for the future

Above all, creating an intelligent robot is a technical challenge and many technical obstacles remain. Developing algorithms that allow a robot to determine what to do if it does not have a policy covering a particular situation is a problem far from being solved. (5-30) Also, the question of common sense - how to enable a robot to use its experiences to make inferences about new situations - is a very difficult research problem [1-22]. As these technical obstacles are overcome, we will then be faced with the question of how socially desirable it is to have intelligent robots [1-30]. It is easy to imagine that some applications of this technology will be deemed too dangerous or too intrusive [3-15].

The most profound effects of this technology could be felt on the least visible members of society [22-30]. Although an intelligent robot could be very helpful to some people with disabilities, it could also decrease the availability of help from family members [1-30]. It could also put a large number of personal care workers out of work. Since robots do not require pay, the cost of around-the-clock care provided by an intelligent robot could be significantly lower than the cost of employing multiple human caregivers, increasing pressure to move disabled people out of their homes and to institutions.

While the potential benefits of AI diagnostic systems are great, it is important to keep in mind that they are only tools intended to help clinicians make a diagnosis. They are not designed to replace human clinicians in the diagnostic process. This means that the responsibility always lies with the clinician when using these systems, and they must use their own judgment to decide what is the most appropriate course of action for the patient.

The main area of AI diagnostic systems is to use software that can interpret medical images; this has been a particularly active area of research. Several studies have been done using AI software to interpret images such as x-rays, CT scans, etc. One example is a study that used an artificial neural network to interpret chest x-rays and classify the results into possible diagnoses. This system has been shown to be more accurate than traditional interpretation by a clinician. Another notable area involves the development of AI systems to interpret medical imaging for cancer detection and diagnosis. Many different systems are being developed for different types of cancer and use various AI techniques.

AI-based diagnostic systems have been researched for over 30 years, but are not yet widely used in clinical settings. There are a number of systems that facilitate the process of taking a patient history. A relevant and significant development is using voice recognition to enter history directly into a computer. A British system called Computer Stethoscope allows the patient to describe their symptoms to a computer, which then uses a database of pre-recorded heart and breathing sounds to compare them to the patient's sounds. This process is still being refined and its accuracy is limited at this point, although it is expected to improve in the future.

Medical image analysis is a demanding field that can benefit from AI research. At a simple level, AI methods for image analysis can be rule-based: if a pattern is detected with a certain level of complexity, then a certain condition is present. More complex analysis may involve pattern recognition in which AI learns features of images that predict a certain disease state. Neural networks and deep learning methods now provide feasible methods for learning from complex multidimensional data, but are currently underutilized in medical image analysis. To provide technologies and methods that are easily adopted by the clinical community, an interdisciplinary approach involving clinicians and researchers in computer science, data engineering, and mathematics will be necessary. This in turn will require incentives and resources to train researchers and establish collaborative research efforts. It will be necessary to foster a community of data and image analysts trained in health informatics and the analysis of clinically targeted data. AI is also ripe for image analysis training applications and software, which may provide an entry point for its use in clinical settings. One of the most important applications of AI in healthcare is the analysis of complex medical data. Interpreting medical images is a resource-intensive task that is a major bottleneck for many healthcare processes. Although medical image analysis is an important area of AI research and has a wide range of potential clinical applications, it has had relatively little impact on direct patient care. This is due in part to the high initial development costs of creating customized solutions aimed at specific clinical needs. This is also due to the challenges of creating seamless integration with existing clinical workflows. Changes in the imaging reimbursement climate, coupled with increasing pressures for evidence-based practice, make a compelling case for automated image analysis.

Final thoughts and recommendations

The study of history and where artificial intelligence is an interesting subject of study. It can be concluded that the study and development of artificial intelligence began a long time ago and experienced stagnation in the decade 1960-1990. Some experts believe that we are on the eve of the golden age of AI. If we look at the trend in the use and development of artificial intelligence, the increase is rapid. However, some say that there is still a long way to go and that many dilemmas will have to be faced. Some opinions are that the development of artificial intelligence can be compared to Pandora's box. This is because a technology is created and then it will be more difficult to control the direction of its use. Any action taken by the AI system can change the surrounding circumstances that affect the future part. This may be a pessimistic point of view, but we should not avoid an eventuality, it is better to prepare for it. The best step to take is to apply foundation control as early as possible to use this technology.

Author contributions

All authors have read and approved the final, revised version of the manuscript.

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Conclusion

The future of artificial intelligence in our daily lives has no limits. One thing is for sure, it will continue to make tasks easier, faster, and in many cases, smarter. The day will come when intelligent machines will perform common household tasks. Today, AI is at work all around us, from highly visible blockbuster results like Honda's ASIMO humanoid robot, to a invisible utility that intelligently filters our spam or provides a quick response on the value of a euro in dollars. It's clear that technological advancements show no signs of slowing down, and there's no doubt that we'll see a lot more of them in the near future. In many cases, our most crucial and life-saving discoveries often seem to occur with the advent of a new tool or program using AI. Just as the space race led to the invention of Teflon, the completion of the human genome project could be said to be marked by DNA assembly programs that intelligently map gene sequences. AI is a game-changing technology that offers more to society than just something new. This essay only scratches the surface of AI techniques and how best to apply them, and at times takes a pessimistic view about replacing humans. There is no doubt, however, that intelligent automation will play an increasingly important role in our lives and that it is in society's interests that it is done well.

References

1. Anderson MR. Twenty years after Deep Blue against Kasparov: how chess match launched the

Big Data revolution. The Conversations website. https://theconversation.com/twenty-years-on-from-deep-blue-vs-kasparov-how-a the chess match started the big data revolution 76882(2017).

2. Baarslag T, Hendrikx MJC, Hindriks KV and Jonker CM. Learning on the adversary in an automated bilateral negotiation: a complete study of adversary modeling techniques. Autonomous agents and multi-agent systems,(2015). 30(5), 849-898.
3. Baron J. Peace of the great powers and American primacy: the origins and future of a new international order. Palgrave Macmillan. (2013).
4. Black J. A story of diplomacy. Reaction, 2010
5. Bock A and Eschenbacher S. The social construction of threats. Iranthe nuclear crisis as a classic example for transformative learning by Jack Mezirow theory. New Prairie Press (2014)
6. Bostrom N. Superintelligence: paths, dangers, strategies. Oxford University Press ;2014.
7. Boutros-Ghali B. An agenda for peace. International Relations, https://doi.org/10.1177/004711789201100302. (1992)11(3), 201-218.
8. Brooks SG. Duel of realism. International Organization, 1997, 51(3), 445-77.
9. Brooks SG, Wohlforth WC. An unbalanced world: international relations and the challenge to American primacy. Princeton University Press, 2008
10. Butterfield H, Wight M, Bull H. Diplomatic investigations: tests in the theory of international politics. Allen and Unwin, 1966.
11. Canapati P. Reverse engineering of the human brain is likely by 2030, expert predicts. Wired. https://www.wired.com/2010/08/reverse-engineering-brain-kurzweil(2010).
12. Carswell AJ. Unblock the UN Security Council. Conflict log and Security Law, 2013, 18(3), 453-80.
13. Chayes, A. The Cuban Missile Crisis: International Crises and the Role of Law. Oxford University Press, 1974.
14. Clark I. Legitimacy in international society. Oxford University Press Computer History Museum. (nd). Timeline of computer history. http://www.computerhistory.org/timeline (2007).
15. Correll JT. Air Power and the Cuban Missile Crisis. Aviation Review. https://www.airforcemag.com/article/0805u2 (August 1, 2005).
16. De Jonge D, Sierra CD-Brane: a diplomatic gaming agent for automated systems research on negotiations. Applied Intelligence, (2017). 47(1), 158-77.
17. Deep mind. (nd). The Google DeepMind Challenge Match. https://deepmind.com/ Alphago-Korea
18. DiploFoundation Mapping the challenges and opportunities of artificial intelligence for the conduct of diplomacy. https://www.diplomacy.edu/sites default/files/AI-diplo-report.pd (2019)
19. Diplo Foundation.Digital diplomacy. https://www.diplomacy.edu/e-diplomacy Dorn, AW, Webb, S. and Pâquet, S. From wargaming to Peacegaming: digital simulations with peacekeeper roles are necessary. International Peacekeeping, (2020)27(2), 289-310.
20. Du S, Zhang Y, Qin R, Yang Z, Zou Z, Tang Y, Fan C. Building change detection using old aerial images and new LiDAR data. Remote sensing https://doi.org/10.3390/rs8121030. (2016) 8 (12)
21. Earle EM. Power politics and American world policy. Review by Nicolas J. American Strategy in World Politics by Spykman. Political Science Quarterly. Encyclopedia Britannica. (nd). Definition of diplomacy, 1943, 58(1), 102-104. https://www.britannica.com/ subject/diplomacy
22. Frankel B. Reformulating the realistic case: an introduction. Security Studies, (1996). 5(3), 9-20.
23. Frieden J, Lake DA, Schultz KA. World Politics (Fourth ed.). Norton. (2019)
24. Fulton S. Top 500: Japanese Fugaku still the fastest in the world supercomputer. Knowledge of data centers.https://www.datacenterknowledge.com (November 18, 2020). supercomputers/top500-the-fugaku-of-japan-still-the-fastest-supercomputer-in-the-world

25. Gabbat A. The IBM Watson computer wins the clash against Jeopardy. Guardian. https://www.theguardian.com/technology/2011/feb/17/ibm-computer-watson:2024 2Dtime,Terminator%2C%20they%20lost%20every%20time(February 17, 2011).
26. Global Security. The Cuban Missile Crisis of 1962: Presentation of Photography evidence abroad. https://www.globalsecurity.org/intell/library/cubakent.htm(2011).
27. Goodrich LM. From the League of Nations to the United Nations. International Organization(1947). 1(1), 3-21.
28. Heinbecker P, Goff PM. Useless or essential? The UN in the 21st century. Wilfrid Laurier University Press. (2005).
29. Hume D. Political speeches. A. Kincaid and A. Donaldson. (1752).
30. James P. International relations and scientific progress: structural realism reconsidered. Ohio State University Press. (2002)