

Artificial Intelligence: Cultural Imagination and Social System

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인공지능: 그 문화적 상상력과 사회적 시스템

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Abstract The aim of this study is to explore the paradigm shifts in culture and system related to life in terms of AI and the present point of view in which creating human values together are important. An approach that focuses on how AI-related phenomena work in modern society forms the basis of this research. Therefore, to clarify the meaning of "AI phenomenon" converging it as a part of social culture, this study was intended to find out the value incorporated in the social system such as ethics and equality together with the literature review. Inferring the technical culture that are combined with the AI that the members of society can do together is as important as technical understanding in the functional aspect. Therefore, this study was intended to suggest new culture that the cultural imagination and the social system create harmonizing each other, that is, the possibility of "AI culture". So, this article has a characteristic of a preliminary study, too.

Key Words : Artificial Intelligence(AI), Culture and System, Imaginary implementation, Paradigm shift, AI Culture

요약 이 글은 인공지능과 인간이 함께 사회적 가치를 만들어 가는 작업이 중요하게 대두되는 현재의 시점에서 생활과 연관된 문화와 제도에 대한 패러다임의 전환을 모색해 보는 것을 목적으로 한다. AI와 관련된 현상들이 현대 사회에서 어떻게 작동하는가에 주목하는 접근 방법은 이 연구의 기초를 이룬다. 이에 "AI 현상"을 사회 문화의 일부로 수렴하면서 그 의미를 밝히기 위해 다양한 문헌 자료를 활용, 윤리나 기술평등 같은 가치를 연계시켜 AI의 사회 제도적 면을 짚어 보고자 하였다. 사회의 구성원들이 함께 할 수 있는 AI와 접목된 기술 문화를 추론하는 일도 기능적인 면에서의 기술적 이해 못지않게 중요한 일이다. 따라서 이 연구가 문화적 상상력과 사회적 시스템이 어우러져 만들어내는 새로운 문화, 즉 "인공지능 문화"의 가능성을 제시할 수 있기를 바란다. 그렇기에 이 글은 하나의 시론적인 성격도 더불어 갖는다.

주제어 : 인공지능, 문화와 제도, 상상의 구현, 패러다임 변화, 인공지능문화

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Received May 22, 2019

Accepted August 20, 2019

Revised August 6, 2019

Published August 28, 2019

1. Introduction

"Artificial Intelligence"(here abbreviated as AI) evolves with humans. AI is now technologically evolving and the process is enough to become a cultural phenomenon. Perhaps one of them is writing a thesis on AI.

Research on AI is explosively under way, in every field such as economy, industry, science, culture, education and law linked with themes, methods and applications. Nevertheless, there are still both expectations and concerns about AI. It's a reality at this moment that the question is changing from 'what AI can do' (beyond the economy and industry, for solving social problems) to 'what AI cannot do'. To that extent, the importance of AI in the future of humanity has not been overstated.

It is also necessary to give a new meaning to AI for the coming AI period, of which the meaning must be agreed and consented by the people. At this point, the above-mentioned question may be repeated again. What can AI do for humans? For this answer, human imagination must be called out. Paradoxically, however, another imagination can emerge here. For example, that is the "creativity" in the sentence "In this age, we need creativity that only human beings can do without artificial intelligence." When the 'Deep Blue' made by IBM defeated the world champion of chess in 1997, the New York Times reported, "It may take more than 100 years for a computer to win a man on Go game." However, it took less than 20 years for the Go program 'Alpha Go' to overturn this word. Interestingly, AI is making it difficult to predict the speed of its evolution. It is one topic of this paper to find out why it is meaningful to know what the background is.

"What can AI do?" This question is proportional to the size of human imagination. This is why the humanistic imagination is important as AI develops. Now AI itself has become a social

infrastructure, like an system. However, many conflicts and disputes are taking place to occupy it. This is why AI as an entity embodying human imagination must have meaning as a social system. And this is another subject of this paper.

This does not mean, however, that there is no need for scientific methods to raise such questions. It is clear that the numerous names given to things we know depend on the power of science. However, it is the product of social institutions and the power of culture that survive to the present day with constant vitality.

Clearly, AI will change in the future. Thinking about artificial intelligence should be more varied and enriched.

2. Discussion of AI and social competence

2.1 The arrival of AI age and emerging study

AI is often understood as an area of computer science that emphasizes the creation of intelligent machines that act and react like humans[1]. Now the word, AI has can be heard in all areas of society. You can easily hear AI in TV commercials and newspaper articles as well as daily conversations of people. AI's time has come.

Research on AI is taking place in various fields. The remarkable development of science and technology has made human life comfortable enough to know where the end is. One of them is AI. But human life is not limited to the material part. Paradoxically, the more the AI technology develops, the darker that lies behind it dominates our minds.

In other words, some of the important discussions on AI are mostly focused on maximizing commercial benefits, and fundamental discussions about the safety of the human stays. However, it is clear that the emergence of

artificial intelligence, especially mechanical entities with their own learning functions, will change the various elements of our daily lives. Accordingly, various social systems that restrict our lives are expected to change, which can be seen as a kind of paradigm shift.

What is needed here is human imagination! Imagination is not just a longing or dream. It is the premise of practice and the driving force of development.

AI is a realization of imagination and a set of new technologies as the power of development. AI became a reality, and the reality became a cultural phenomenon in society. It may also be the closest being to human beings who should be responsible for an axis of the future world.

2.2 Evolution of the AI Categories

Human life is connected with various values. It is perhaps natural that people do not agree on how to punish and sequence them. Even if someone's point of view is objectively correct, what we can approach is only the 'belief' of what is right. The imagination that allows science to develop is further needed in this situation.

Imagination has created a free human being. And it includes efforts to overcome human limitations. Even if scientific and objective factual analysis is an attempt to resolve social conflicts, we can not go beyond imagination. Imagination is the premise of science. Nonetheless, imagination shows the present science as a small thing.

AI is the product of imagination. The use of AI is the forming action of social culture. And this recognition requires stabilization of AI. Now people should look at AI and social systems together in time synchronism.

The social system appears in various forms, but itself is a cultural phenomenon. In the process, all kinds of human minds are involved. Fear and curiosity about newness are crossing,

hopes and frustration are repeated. However, the appearance of AI changed the process and the order very quickly. It has become a testimony before the eyes that culture is making the system. It also reminds us why it is important to give direction to culture through human imagination. Therefore, it is necessary to understand the AI embodied as a cultural value and the social system that supports it, and to create a society in which AI and human beings coexist harmoniously.

3. AI as a means of life

3.1 Appearance of AI and its cases

As is widely known, AI first appeared in the 1956 legendary "Dartmouth Summer Research Project on Artificial Intelligence"[2]. Over the next sixty years, research on AI has not been limited to engineering or science in the traditional sense, but has been carried out in various fields such as humanities and social sciences. Perhaps it is more appropriate to try to deal with the outside world of the AI world based on human emotions rather than science and technology.

Let's take one example. At the "ImageNet Large Scale Visual Recognition Challenge (LSVRC)" in 2012, the University of Toronto's Super Vision team, which first participated in the Image Recognition Challenge, won the competition with a remarkable difference of 10% error-rate improvement comparing competitors[3].

It is clear that AI has entered the human emotional realm, and it is natural that new attempts will continue to be pursued in the future. However, many attempts still depend on humans. The reason the Super Vision team could win was in Deep Learning, a new machine learning method[4]. It was the evolution of the program by humans.

The belief that AI is possible has already

existed centuries ago, but at that time it was a philosophical debate about the relationship between brain and mind rather than AI itself. But over the time, that belief has become reality, and since computer science has developed in earnest from the mid-20th century, AI has reached a point where it has to set itself a new definition. In recent years, we are also introducing automated machine learning solutions that allow you to create, compare, evaluate and analyze expert-level models with just a few clicks without complex coding. In January 2018, Microsoft announced an artificial intelligence system called the "Drawing Bot." AttnGen(Attentional Generative Adversarial Network) is a formal name for this system. Two years ago, in April 2016, with the Dutch artificial intelligence researchers, they learned about 350 works of Rembrandt Van Rijn, a painter who was called 'Light Magician' through 'Next Rembrandt' aiming to draw a picture of similar style.

This mechanical system is an example that goes beyond the assumption that AI can express emotion as a variable of human activity, not human. In general, even if the computer answers, they do not think the answer is something intelligent or cognitive. However, in deep learning technology, the concept of learning objects and ideas from data itself is called Representation Learning. This representation learning can be a breakthrough that pioneers a new AI age. The problem is how wide its scope will be.

3.2 AI, industrial society and emergence of social systems

Since the Davos Forum in 2016, interest in The Fourth Industrial Revolution has grown in earnest. Companies are creating new innovation organizations and advocating digital innovation in line with society and changing times. But before that, many nations had already been preparing for the upcoming revolution in their

own way. Examples include Germany's Industry 4.0 (2011), the US Industrial Internet (2012), Japan's Robot New Strategy (2015), and China's Manufacturing 2025 (2015). AI is the core strategy and technology that modern nations and corporations should prepare for in the course of society-wide change caused by the Fourth Industrial Revolution. For example, AI technology allows companies to create a flexible data-driven analysis and forecasting and flexible convergence of diverse innovation technologies. The level of industrial development is determined by the AI level.

It is not easy to know objectively AI, computer technology and robot are on what level now, human being should study more harder and what technology is practically impossible. Paradoxically, AI and artificial intelligence, and furthermore, the difficulty of having the right future and right perception of science and technology are also due to human desire and industrial demand for convenience. Technology and society are so connected.

This is one of the changes that artificial intelligence, which many people worry about, will bring. This also affects changes in work and occupation. Artificial intelligence has been researching intelligent agent or helper robot technology that has resembled human beings for a long time, and recently it has invaded the domain of human work such as robot visor and robot journalist[5]. Even in the realm of art, such as music and art, artificial intelligence has begun to replace man's work.

Advances in robotics, artificial intelligence and automation will make many jobs useless for decades to come. Although in the case of UK, as shown in Table 1 below, many jobs will be affected by the development of artificial intelligence.

Table 1. Impact of artificial intelligence on jobs[6]

Industry sector	% of existing jobs(in 2017)			Number of jobs(000s)		
	Creation	Displacement	Net effect	Creation	Displacement	Net effect
Health & social work	34%	-12%	22%	1,481	-526	955
Professional, Scientific & technical	33%	-18%	16%	1,025	-541	484
Information & communication	27%	-18%	8%	388	-267	121
Education	12%	-5%	6%	345	-158	187
Accommodation & food service	22%	-16%	6%	518	-371	147
Administrative & support service	23%	-24%	-1%	698	-733	-35
Other sectors	13%	-15%	-2%	466	-533	-67
Wholesale & retail trade	26%	-28%	-3%	1,276	-1,403	-127
Construction	12%	-15%	-3%	279	-355	-75
Financial & insurance activities	18%	-25%	-7%	209	-286	-77
Public administration & defence	4%	-23%	-18%	64	-339	-274
Transportation & storage	17%	-38%	-22%	296	-683	-387
Manufacturing	5%	-30%	-25%	133	-814	-681
Total	20%	-20%	0%	7,176	-7,008	169

–Estimated job displacement and creation from AI by industry sector(2017-37)–

Interestingly, there are also prospects that countries with robots will be rich and unemployment rates will be low. It is also likely that very poor countries, along with very wealthy countries, will be more likely to adapt to the great changes that will come. This is because in wealthy countries there are often resources to quickly add robots and prepare for population change. On the other hand, poor countries are forced to make mass production that is at risk due to automation[7]. The figure 1 below shows the reversed form of

**Fig. 1. Robot ordering the human out[8]**

human and machine, which is a paradox that appeals to emotions with visual approach.

Paradoxically, in the era of artificial intelligence, people feel anxiety that they will lose more jobs than now, or fall into more serious poverty. Human beings have already lost much of their labor to automation machines or robots in the pre-AI stage. One of the biggest causes of mass unemployment happening in the world today is the appearance of automation machines and robots. It is natural that the fear of the universalization of artificial intelligence will further deprive people of jobs from human beings.

However, a life that has been deprived of its labor by artificial intelligence can not be imagined as a modern human being. Even if artificial intelligence deprives human occupation and labor, humans must constantly plan for something using intelligence and constantly use the body to accomplish something.

Production and consumption are an important part of the economy. If many people lose their jobs and fall into poverty, society will lose its vitality and lose its function and will also fall into poverty. Therefore, it is meaningful to claim that robot taxes should be paid to companies and individuals who benefit from the operation of artificial intelligence. In this way, artificial intelligence becomes connected with industry, and the social system of law is introduced in it. It is not to say that the future of poor countries is the end of society without AI.

4. The future of AI and Paradigm

4.1 Realistic problems and systematic elements

"When artificial intelligence makes decisions on behalf of human beings, who should be responsible for the results?", "Can personality such as reason, emotion, self-consciousness, autonomy and free will be technically feasible in

artificial intelligence?", "Is the personality shown by the robot the same as the personality of the human being?" etc began with the appearance of AI. Furthermore, the issue of the legal status of AI or the content of happiness should be newly established[9]. In the future, it will be necessary to develop such research so that attempts to find human and machine natures can naturally be maintained.

Artificial intelligence is a paradigm that modern society should accept[10], but it will soon become an important factor in changing the paradigm of social structure and culture. The paradigm shift brings about many problems in various contexts. It will also change the meaning of artificial intelligence, and its perception of the use of artificial intelligence. If there are moral conflicts involved, there may be cases where there is no concrete means to solve various problems.

One thing to note here is that inequality between various values is inevitable. Scientific knowledge is calling for a change in the paradigm that emerged in modern society, regardless of whether it is substantive truth. Thus, in a general sense, the results of social scientific analysis may be merely a dictionary review.

Nonetheless, the presentation of persuasive arguments from a realistic perspective is clearly an obligation of social science. Scientific knowledge on AI can contribute to the formation of a culture by examining the feasibility through social science analysis and persuading.

However, we need to pay attention to changes in the essential aspect. Today we live in a rapidly changing technology civilization era. And we think of this change as development and optimize the future life. But what we must bear in mind is that this development does not always make human life more meaningful. Behind the development of brilliant technical civilization there are social ills, contradictions of life, and alienation.

Here again, another question. Will humans really become slaves to machines? This question is also linked to how undervalued the possibility of disaster is compared to the benefits provided by the new technology for unresolved issues related to the risks of technology.

Concerns such as the prospect that humans will literally become slaves to machines seem very speculative. Philosophers have played a role as external critics, but engineers are engaged in engineering activities and reflect sensitivity to human values in system design[11].

Let's find the answer to the previous question. Human beings who make AI can, at least theoretically, become truly moral agents with ultimate responsibility, which is related to the human right embodied in the system. In this regard, figure 2 shows a brief criterion. In order to understand the increasingly complex and sophisticated instrumented machines, such as the autonomous systems shown below, an artificial moral agent must focus on two aspects: autonomy and moral susceptibility. It is the "ethics created" that can appear here. Systems with limited autonomy and emotions have functional morality and become more sophisticated as they ask themselves, answer and evaluate themselves.

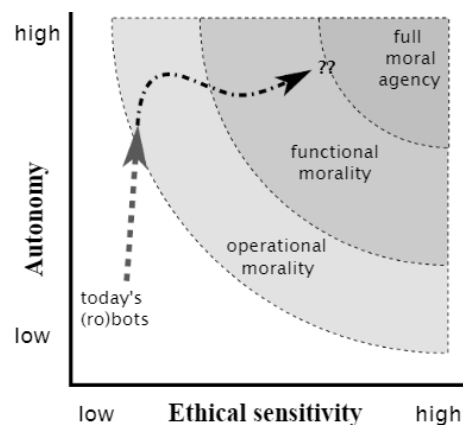


Fig. 2. Autonomy and ethical sensitivity of systemic machines[12]

Research on artificial intelligence has taken the concept of the human brain to a point where it greatly outperforms conventional computers[13]. Culture in the era of artificial intelligence is a system about institutional reality. Artificial intelligence technology is also calling for a paradigm shift in culture and system at this stage.

Autonomy is the foundation of culture. But more discussion is needed as to whether it should be the future of artificial intelligence.

4.2 Technology in society and AI culture

The diverse achievements demonstrated by the scientific nature of the natural sciences have enabled us to have strong trust and expectations about the possibilities of social sciences. The expectation that an objective judgment of a mechanical entity beyond an imperfect judgment can be made makes it feel like a situation that can realize the unfinished ideal that human being has pursued. In other words, there is a possibility that the analysis of objective data presented through AI and the result of the judgment will be a scientific alternative that can not be denied by anyone.

Artificial Intelligence technology has evolved through several periods of revival and downturn. It is true that the expectation that the possibility of judgment similar to human beings can be obtained through this process has been amplified.

AI has a variety of contexts with rich semantics that can be understood and interpreted, a non-designed and partially unknown environment, physical interactions with humans requiring delicate and socially acceptable control strategies, and it should be possible to assume the possibility of natural and multiple communication requiring the expression of mind[14]. Paradoxically, understanding human beings in a new era may have to be preceded in order to work with humans and space together successfully.

The evolution of artificial intelligence is similar to what humans have done so far. Creativity is based on the imagination of human beings. Creativity is a fundamental feature of human intelligence and can be a challenge to AI. Artificial intelligence techniques have created transformations that enable the creation of ideas that were previously impossible by exploring the potential of conceptual spaces[15].

In the fourth industrial revolution era represented by the words of hyper-intelligent, hyper-connected and the convergence, AI is changing the relations between the human and the human, the object and the object, and the human and the object newly. As mentioned previously, the AI technology will accelerate the changes in the meaning and the form of labor and almost all occupations can receive the influence by AI. It is the reason that calls for the emergence of systems that reflect the characteristics of society. Accordingly, the social and legal issues on the job losses, project-type labor relations, robot tax, etc. will be emerged continuously[16].

The ethic issue derived from AI will be expanded to the legal obligations of that technology itself and to the automated inequality. In addition, for the researchers of AI, it will demand the another values such as contribution to the mankind, fairness and the safety[17].

Big data and block chain technologies[18,19], which are based on AI, will accelerate the evolution of AI more paradoxically and will cause the issues like cyber hacking and invasion of privacy. These phenomena will be connected to the concentration of wealth and the digital information gap, too. which will hight the issues of lack of citizen moral and the human commercialization. It is true that the people fear the changes of life to be brought by the AI technology due to such adverse effects. To relieve such fear, the effort to improve the legal systems will be required in the political aspect,

too[20].

However, the AI technology apparently will continue to exist with the human for a very long time. It is 'AI Culture' that can be emerged here separately from the legal order, which is presented as one of the social systems. AI Culture is the way and the pattern of life. To prevent or reduce its side effects such as dependence on the technology of avoiding the problem, suppression of imagination to suggest the solution, etc, the discussion on that should be continued more extensively in future. One of them is to forecast the future society to be changed by the development of technology and to research the norm required, which are possible only if we can imagine AI paradigm continuously.

The improvement from the analog to the digital society may be the matter that changes the existing systems entirely. Now, AI is going beyond the boundary of imagination and the science and technology hard to determine its extension with social systems.

5. Conclusion

In the meantime, artificial intelligence has evolved, experimenting various possibilities and identifying limitations. The "AI Assistant" took the place of people and even asked us what the area of people and AI is. Now, artificial intelligence has made remarkable achievements not only in the fields of computation, analysis and summarization but also in areas such as visual, spatial and language.

As already mentioned, artificial intelligence is concerned with implementing a computer to perform tasks that are currently available only to humans[21]. The benefits of technology change must be shared by everyone. With the advancement of technology, now anyone can borrow the power of artificial intelligence to achieve professional-level results. So, if you are

only interested in the application field, then there will be an AI age that can do the work with a little effort and investment.

AI has come again after 60 years with new possibilities. Human beings are entering the unknown world created by AI. Our everyday life has already been linked to so many AI. The future connected with AI has already passed deeply by us.

Now, in order to prepare for the change that the AI is driving, we must analyze and reorganize the whole activities in all areas of society. Finally, this paper emphasizes and suggests two points.

First, it is the creation of "artificial intelligence culture(AI Culture)" adapted to the changes of society. This study focuses on that part. In particular, this paper attempts to assert the harmony of social systems and cultures related to AI.

Second, more people should be able to use AI. In other words, it is necessary to solve the legal problems and to build a social system so that it is not inconvenient for people who are not easy to access artificial intelligence.

The consumption of artificial intelligence inevitably promotes its production. AI, which is a fusion of technology, imagination and culture, should become the best commercial work in human history in the future. To do so, artificial intelligence culture is even more necessary. Perhaps this can be a reason of the paradigm shift of AI culture. Human beings are expecting the activity of AI.

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