

Society capable of coexisting with AI: From my research perspective

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Summary

Artificial Intelligence (AI) has already become an indispensable part of our society, and it is quite likely that AI will keep occupying a more important position in the foreseeable future. However, there are some questions regarding to AI that are inevitable for society to answer: what is the meaning of AI to human society? How should we view AI as part of our society? What does it mean to become a society that is capable of coexisting with AI? This essay is attempting to provide possible answers and thoughts on these questions. The main body of this essay will be divided into two main sections. In the first one will be indicating the significances of AI for human society, which is quoting on Teilhard de Chardin's book *The Phenomenon of Man* to argue that the development of AI can actually be interpreted as a phenomenon of human evolution in terms of both physical and psychological. The second part of the essay will be the discussion based on answering the core question: What is a society capable of coexisting with AI. The discussion is based on researches on various papers and document written regarding to the topic of AI, on its application in practical field and ethical issues. This essay will draw around Teilhard de Chardin's philosophy to argue that as the development of AI is a phenomenon of human's evolution in both definition of physical and psychological development, our society should be developing in terms of capacity of coexisting with AI in order to meet the requirement for the future development of mankind. Such society should be 1) capable of utilizing AI technology efficiently to bring positive development to our society in various fields of industries, 2) capable of establishing meaningful communication and interaction with AI in order to gain new innovation for the benefit of human's future development, and 3) capable of resolving various issues that might arise in the course of AI development, and evolve the human society along with AI into a new era.

The significance of AI for human society

According to Pierre Teilhard de Chardin's theory described in his book *The Phenomenon of Man*, every matter in this universe, including the Earth, life, and certainly humans, has the sphere of both "without" and "within", or external and internal. As de Chardin's main argument in his book, the advent and development of human species should be defined as a phenomenon of the evolution of earth, for which humans is the only exception in the life branches who is capable of processing thought (de Chardin, 1959). The argument of this part of the essay can be related with de Chardin's idea presented above, that AI is a phenomenon of humans' evolution (which is for sure created by humans itself), for which AI is representing the development of both humans' external condition and inherent world.

AI as invention for developing humans' "external" condition

As described by de Chardin, as the moment "Homo Sapiens" has taken its shape, the modern humans has hardly made any major evolutionary progress in terms of physical condition. The archeologic discovery has confirmed such facts: "So clearly are they our that...the paleontologist, accustomed to working on pronounced morphological differences, no longer finds it easy to distinguish between the remain of these foil men and the men today (de Chardin, 1959, p. 201)." In summary, de Chardin has pointed out the fact that the physical condition of modern humans has been through little, if any, progressive development compared to those of their ancestors'. However, such fact will probably be, in some ways, cease to apply in the near future. An article on InfoWorld has indicated that exoskeleton, aided by AI technology, will serve for the purpose of increasing humans' physical capacity, or assisting the disabled personnel for medical recovery, or even regain their physical mobility. The exoskeleton has the advantage of using collective intelligence, collecting data for service improvement and high adaptivity (InfoWorld, 2017). In terms of aiding the handicaps, the exoskeleton is extraordinarily helpful in helping the limb disabilities to recover. According to IEEE Spectrum, HAL (Hybrid Assistive Limb), a lower-body exoskeleton produced by Cyberdyne, a Japanese robot company, has got its permission from the U.S Food and Drug Administration to be practiced in medical use. The equipment will detect the signal sent by the brain telling the muscle to move, then assist the user with strength and stability enhancement (IEEE, 2018). Although the external development is important, the AI, in fact, has more contribution in the development of humans' "inherent" capacity.

AI as the phenomenon of humans' "inherent" evolution

The most important part of "hominization", according to de Chardin, is humans' ability of processing thought. With the development of "hominization" have eventually led to the advent of what de Chardin described as the "noosphere":

Our picture is of mankind laboring under the impulsion of an obscure instinct, so as to break out through its narrow point of emergence and submerge the earth; of thought becoming number so as to conquer all habitable space, taking precedence over all other forms of life; of mind, in other words, deploying and convoluting the layers of the noosphere (de Chardin, p. 191, 1959).

Throughout the history of the development of humans' "noosphere", we have already invented enormous tools or methods to develop our capacity of thinking, analysis and calculation: language has been invented to enable sophisticated communication between individuals; writing has been invented to enable us to record our thoughts and memories; numbers and mathematics has been invented to develop our capacity of calculation using discovered formula. Artificial Intelligence, in some way, has also been invented to serve a similar purpose. The very symbolic product of artificial intelligence, the computer, for example, is developed during WWII to decipher the German Enigma code, which was beyond humans' calculation capacity. Today, artificial intelligence has already liberated humans from various works that are repetitive or dangerous, but meanwhile inevitable.

However, the value of artificial intelligence is far beyond a useful tool. The key difference between artificial intelligence and other tools humans has invented is that, the AI is capable of performing the job of calculation, analysis or thinking by itself, with minimum, if any, supervision or assistants by humans. To take this argument further, in terms of processing works of thinking, AI seems to be a more ideal candidate than human beings. Once they are programmed to perform their assigned works, they can keep on working 24 hours a day, without the necessity of nutrition, resting or mental comfort, unless there is some hardware or programs errors occurred, or the energy sources is unplugged. In addition, the processing capacity of AI is in constant development. The famous "Moore's law" is best suitable for describing the speed of processor's development: "the number of transistors in a dense integrated circuit doubles approximately every two years (Aura-tech, 2017)." The first microprocessor, the Intel 4004, is produced in 1971 and consisted with 2,300 transistors; in 1979, the Intel 8088 is consisted with 29,000 transistors; the first series of Intel Pentium released in 1993 has 3.1 million transistors contained; today, the multi-core CPU such as Intel i5 or i7 has already become a normal component of family computers (ZZOOMIT, 2019). In comparison, how many developments has taken place, in any, in the brains of humans within the last two decades? In other words, can we say that artificial intelligence is developed by humans as the reflection of their desire for accomplishing their evolution in terms of the "noosphere"?

What is “a society capable of coexisting with AI”?

After understanding the significance of the artificial intelligence and the meaning of it toward human beings in terms of evolution, we can then answer the thesis question presented earlier in the article: what is a society capable of coexisting with AI? Perhaps we can separate the discussion into three sequential categories to discuss the answer to this question: a society capable of utilizing technology of artificial intelligence efficiently to bring positive development for human society, a society capable of communicating and interacting AI sufficiently with artificial intelligence for new inspiration, last but not least, a society capable of actively developing and evolving with AI to bring the human society into next stage.

Society capable of utilizing AI for positive development

As mentioned in previous text, the primary purpose for humans to develop artificial intelligence is to assist humans in various field of works and replace some irritating or dangerous ones. In such ways, a society that is not capable of bring AI technology into effort of positive development can certainly not be defined as “a society capable of coexisting with AI”. In fact, AI has already become part of our industries in various ways, and it will probably take increasingly important position in our society.

Ming-Hui Huang and Roland T. Rust, in their essay about the use of artificial intelligence in Service industry, have argued that it is possible for AI to replace humans in the field of service industry, Which people once thought was impossible because of their “inhumanity”. They introduced the theory of dividing service AI into four categories, or steps of development: the first, mechanical AI is capable of minimum learning and adaption, can perform simple and repetitive works in place such as fast-food or self-services restaurant. Second, the analytical AI is capable of systematic learning and adaption based on data analysis and can perform analytical and systematic works such as in-car intelligence assistant and customer information. Third, the Intuitive AI is capable of learning and adapting based on their understanding of information or theories they have encounter and can perform works requiring complex and personalized thinking, such as senior managers or physicians. The final stage, the empathetic AI is capable of learning and adapting based on experience, and also apprehending the complexity of humans' emotion, which is capable of performing works such as psychiatry and customer services (Huang & Rust, p. 157-160, 2018). Although the majority of AI applied in service fields are still in the mechanical and analytical stage, all of these types AI listed, however, does already have some prototypes or theories been developed in experimental stage.

Others have also written articles about the application of AI in different industries. David C. Parkes and Michael P. Wellman, in their essay “*Economic reasoning and artificial intelligence*”, argued that artificial agents are probably more familiar to the normative design of economic

models than people (Parkes & Wellman, p. 267, 2015). They have argued that the multi-agent system is more suitable to deal with the intricate calculation of prediction for economic reasoning, and the model of such AI also need not to be understandable because it is not part of their purpose for function (Parkes & Wellman, p. 269-270, 2015). Nicholas Diakopoulos, argued in his article *Paving the Human-Centered Future of Artificial Intelligence+Journalism*, argued that “AI is a new medium through which journalists can express and exercise their ethical and normative values through the code they implement (Diakopoulos, p. 679, 2019).” He has also argued that AI can possibly create more occupation, instead of diminishing, in the field of journalism, which is the issue most people are concerned about. New occupation such as “the configuration, parameterization, knowledge management, data production and template-writing (Diakopoulos, p. 680, 2019)” can possibly be new opportunity, and insert fresh blood into the field of journalism. The application of AI in journalism industry, as he emphasized, however, must be “human-centered (Diakopoulos, p. 680, 2019).” V. Buch, G. Varghese and M. Maruthappu, in their article *Artificial Intelligence in diabetes care*, pointed out the application of AI technology in diabetes care and the significance of machine learning in the transformation of the caring method (Buch, Vargese & Maruthappu, p. 495, 2018). They discussed the meanings of AI application for different participant involved in the diabetes care: the patients (person with diabetes), the healthcare professional and the healthcare system, and also the significance of big data for improving the systematic caring (Buch, Vargese & Maruthappu, p. 495-496, 2018). Another article also indicated about AI's contribution in medical field, *Artificial Intelligence in Drug Design* by Gerhard Hessler and Karl Heinz Baringhaus, pointed out that AI plays a significant role in drug discovery; the learning and problem solving skill of AI is extremely useful in some processes of drug design such as the optimization of efficient compound design, and use of data base for the prediction of cross target activities (Hessler & Baringhaus, p. 1-2, 2018).

After learning such numerous examples provided about AI application in various field in our industries, it is not difficult to realize that artificial intelligence has already become an essential part in our life. However, as I mentioned in the beginning of this article, we should not see AI as merely a tool, or an object. The next part of this essay is going to be devoted into the discussion of the necessity of establishing communication and interaction with AI.

A society capable of communicating and interacting with AI

Why it is important to communicate with AI? The reason is simple: Communication and interaction is the key for new innovation. In terms of human-human interaction, that is a common agreement that we can be no better familiar with. The human history of communication has left enormous legacy and lessons for us, such as the silk road, the great geographic discovery and the break of Berlin Wall. Whenever the communication is emphasized and encouraged, there must have been impressive development, as well as advent of new

innovations. In contrary, whenever the communication is limited or forbidden, tragedies are usually the consequences. Enormous technology has been inspired by people's eagerness for faster and more efficient ways of communication: from telegraph to telephones to Internet; international laws and global organizations has been set up to guarantee the safety and freedom of communication. All of these signs have shown people's recognition for the importance of communication. However, there was an ultimate problem that people would face: Afterall, human beings have only themselves to communicate with. Obviously, we are the only intelligent specie on this planet, and so far, there is no sign of any other alien species that is capable of reaching us. The importance of discussing this problem is to indicate the fact that the innovations come out of such communication, no matter how numerous they are, are destined to be limited to the secluded realm of humans' logic. However, with the advent of artificial intelligence, there comes a slight hope for resolving such problem, for which AI can possibly be an alternative partner of communication.

According to Beata Stawarska in his article about the implication of relationship between human beings and AI (or robotics), I-you connection has definite influence on people's shape of self-identity, which is also established much earlier than the later one. He argues that "speech" is the ability that enable us to communicate with each other and gain the traits of "sociality", and only after that people can find their own identity about "I" (Stawarska, p. 4, 2017). He has also pointed out that the I-you connection does not limit the opponent of communication, and thus the development of communicational AI and robotics is important because it will probably bring us surprise and new innovation (Stawarska, p. 7, 2017).

Some other articles, however, presented with more conservative approach on this topic. Alex Guilherme has argued in his article about AI and education, that AI is not necessarily an optimistic opponent of communication for children. Borrowing ideas of I-Thou and I-it relation from the *I and Thou* by Martin Buber, he first argued about I-Thou relation to be a more ideal model for education than I-it relation, for its emphasis on the communication and interaction between teacher and student (Guilherme, p. 50, 2017). Then Guilherme takes his argument further to argue that the relationship between AI and human beings is more likely to be I-it rather than I-Thou, and therefore will lack chances for student to establish I-Thou relations if they have been through the AI taught education throughout their youth (Guilherme, p. 51, 2017). Kathleen Richardson, in her article about ethical issues in human-robotic relationship, raised concerns about the issue of social identity. She firstly addressed the importance of I-Thou relation in the formation of sociality, then she brought the concept of "species-specific sociality" into discussion (Richardson, p. 77, 2017). He argues that the traits of human sociality are established by I-Thou communication among humans, which she presented counter evidence about the examples of feral children, who were believed to be raised by animals at some point

of their childhood by various reasons. She pointed out that all of these feral children have the “break-down in human relation” in common, and most of them found enormous difficulty in the process of returning into human society (Richardson, p. 79, 2017). She then raised concerns about human-robotic relations, that the constant association with robots, especially in one’s childhood, could bring negative influences on their sociality (Richardson, p. 80-81, 2017)

Both authors have expressed their concerns about the ethnic and identity issues that might arise together with the development of AI. Despite the fact that the intelligence of AI has been developing at a tremendous speed, it is still quite common for people to uphold the idea of considering AI as an “inhuman” object and being frightened about whether interacting with such an alien creature would distort our identity as humans. However, we must realize the fact that human self-identity is not a stationary object; in fact, it is constantly changing along with the development of our society. If a person had time-traveled from 500 years ago to the present, he/she would certainly find modern people to be bizarre and lunatic, for most of them are atheists, writing in languages other than Latin and are governed by nation-states instead of a king or a queen. As artificial intelligence is developing constantly, human beings, as well as their society, should also develop new consciousness in order to achieve coexistence between the two. This argument, moreover, will take us to the next part of the article, which contains some final thoughts and elaborations on how a society should develop along with the development of AI.

A society capable of developing and evolving along with AI

Summarizing the context we have mentioned in the previous part of this article, our present and future society should be capable of utilizing AI technology efficiently to bring about positive development and establish active communication and interaction with AI to gain new innovations. However, viewing AI as merely a useful tool, or a funny opponent for conversation will not be satisfactory for the requirements of the future development of human society. As we have mentioned in the first part of our article, AI is in constant development and evolution, but humans are not, at least not on such a tremendous scale. In order to navigate the route for the future evolution of human society, integrating AI as an indispensable part of it will become a conclusive option. Thus, there are some new questions that are inevitable for us to provide answers for: How should we define AI as part of our society? How should we solve the ethnic and identity issues that are listed above? What are some rules that we should consider in order to increase efficiency, or avoid possible risks in the practical application of AI?

Some pioneering discussions have already been taking place. In an article authored by Cao Jianfeng and Fang Linman introduced the discussion of AI ethics and innovation about a new government method in the European Union. In April 2019, two important documents have been released by the EU regarding the AI topic, the *Ethical Guidelines for Trustworthy AI* and *A government framework for algorithmic accountability and transparency*. The first document

discussed about the ethnic issues about AI and have set up three principles of a “trustworthy AI”: 1) Following fundamental rights and regulations, 2) respecting core principles and values of human society, for “ethnic purpose”, and 3) technically robust and reliable (p. 3, 2019, Cao & Fang). In the guidelines for realizing a “trustworthy AI”, the documents suggest that seven principles should be followed to avoid the protentional risks, they are: 1) Human’s supervision to ensure AI is functioning within the range of fundamental rights; 2) technical reliability and security, to ensure the function and decision-making system of AI to be accurate and safe from possible cyber-attack; 3) privacy and data management, to ensure the protection of user’s privacy and eliminate chance for illegal usage of data; 4) transparency, which all process of AI’s analyzation, decision-making and result should be traceable and explainable; 5) diversity and non-discrimination principle, to check on AI’s decision and avoid discrimination over less privileged or marginalized groups of people; 6) Social and environmental welfare, to encourage application of AI in studying and solving issues such as self-sustainable development and environmental issues; and finally 7) accountability, for tracing the responsibility in development and application of AI, and establish solution to minimizing the damaged caused by mistake made by AI (Cao & Feng, 2019, p. 4-5).

These are indeed exciting signals, for they are not only attempting to setup regulations for practical application of AI, but also enriching the social consciousness of human society in order to integrate AI as part of it. However, these attempts are only the tip of the icebergs in the social changes that are necessary for developing our society into the “era of AI”. For example, future ethnic issues will probably come one by one, such as the intimate relationships between humans and robots, the application of AI in medical care or AI figure takes position as state leader. All of these issues, sooner or later, will probably become our new concerns about the practical application of AI in the future. Thus, it is becoming increasingly essential for human beings to setup new concepts and definitions into our social consciousness by giving satisfiable answers to these questions, otherwise these issues will probably become major obstacles to keep us from benefiting from the development of AI. This is what I define, as a society that is capable of developing and evolving along with AI.

Conclusion

In summary, the article mainly discussed about two interconnected facts, that the development of AI is a phenomenon of humans’ evolution in both definition of external and internal, and the human society should develop into the one that is capable of coexisting with AI. The necessary traits that such society should obtain, as presented above, are 1) capable of utilizing AI technology efficiently to bring positive development to our society in various fields

of industries, 2) capable of establishing meaningful communication and interaction with AI in order to gain new innovation for the benefit of human's future development, and 3) capable of resolving various issues that might arouse in the course of AI development, and evolve the human society along with AI into a new era. A fascinating society that is truly capable of integrating and coexisting with AI, somewhere is the possible future, must be beyond the imagination of any of us today.

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