



Research on the Education Future Scene of Artificial Intelligence from the View of Machine Behavior

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Abstract. The Paper mainly aims to the artificial intelligence application in education from the perspective of machine behavior. Firstly, the paper researches the connection between artificial intelligence and education which has caused researchers' interests. And it becomes one of the main forces leading the fourth industrial revolution. The long-standing research and decades of development of AI technology have laid a profound technical foundation for the field of "AI + education". Secondly, the paper focuses on the AI application in education which is mainly reflected in teaching technical tools, teaching data analysis and teaching curriculum management. At the same while, there are some problems, such as data selection deviation, students' emotional neglect, classroom subject dislocation. The blending of the building field in AI and the education field nurtured by history is undoubtedly a game of symbiosis and collision. Then there is an obvious contrast between the emphasis on efficiency, the immediacy of effectiveness, the fragmentation of technology, the identity of use, the emphasis on effect, the post-dominance of representation. Finally, the paper concludes that machine behavior provides us with a new perspective and opens up the research direction of machine intelligence.

Keywords: artificial intelligence · machine behavior · algorithm

1 Introduction

The concept of Artificial Intelligence emerges since 1960s and related research has been through more than 50 years. Because of the complexity and diversity of the concept, different researchers have totally different cognitive understanding. Empowerment of AI on education becomes the focal point of educational researchers. They care about not only the advantage of AI on education but also the challenges, ethics and rules. Why the AI application effect of education is not good? How to regard and respond to the challenges and problems of AI application in education? The paper will firstly induce and analyze these questions. Secondly, the development opportunity of AI application in education will be surveyed. Finally, the paper will put forward to corresponding strategic suggestion and describe the future picture of AI application in education.

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V. Balakrishnan et al. (Eds.): ICMEIM 2022, AHSSEH 6, pp. 980–986, 2022.

https://doi.org/10.2991/978-94-6463-044-2_123

The application covers intelligent tutoring, self-adaptive learning and data decision, which mainly embody tools of teaching technology, teaching data analysis and teaching curriculum management. In terms of tools of teaching technology, the initial consequence of AI application in education is the update and progress in related tools. And it is the most superficial manifestation of AI education. Intelligent teaching system promote the development of online learning, and discriminate and rectify students' advantages and defects in the process of learning. Then personalized guide and resolution are recommended. At the same time, because its personalized teaching mode, unique communication between students and teachers, and low price, intelligent teaching system relieves the fairness problems of educational resources. The AI influence on teaching tools is developed from online to offline and from virtual reality to material object.

In terms of data analysis, educational big data produced by intelligent learning system becomes the firsthand sources of teaching reference. And the feedback suggestions from students are used to improve educational application of technology design.

In the field of teaching management, problem report is produced through the collect of algorithm data, for example, the construction of intelligent campus, the analysis of test papers. So the AI applications in education are mainly focused on using some specialized technical methods to solving the problems of teaching and learning, which shows the character of applicability and practicability. Concurrently, it becomes more intelligent, personalized and pragmatic. Therefore, when we embrace the AI application in education, at the same time, we should go over these influences and have provident reflection.

2 Problems Brought by AI Application in Education

The first problem is the data-choosing deviation in the process of teachers' teaching and students' learning in class. Because AI application in education makes learning more autonomous, students are habitually guided by their own interests, which tends to choose knowledge fields that they are interested. In the process of using teaching technologies in class, teachers prefer to trust in these data which can analyze and show learning problems. While students cannot get comprehensively assessed which will lead to assessment einstellung and algorithm bias. The second problem is the ignorance of students' feeling. Current AI application in education cannot collect and assess all-round data and information which include students' feeling, attitude and thinking. Feeling is one kind of superior thinking. AI technology still cannot exactly imitate and apply human feeling. What AI machine cannot do just is what teachers can do to cultivate students' abilities. The third problem is AI may lead to disfunction in the role of students and teachers. Intelligent technologies make teaching and learning more dependent. Teachers may arrange teaching contents onto AI technologies. Though AI cannot take place of the teachers' role in student cultivation, AI would take some responsibilities of teaching students. At the same time, students would pay more attention to the operation of AI technical equipment so that they pay less attention to class learning. These may affect students' learning result. Therefore, AI researchers and users should be responsible to how to use AI technology.

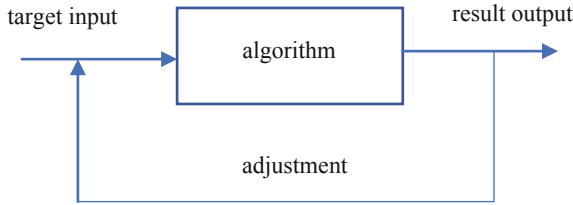


Fig. 1. Research on machine external behavior

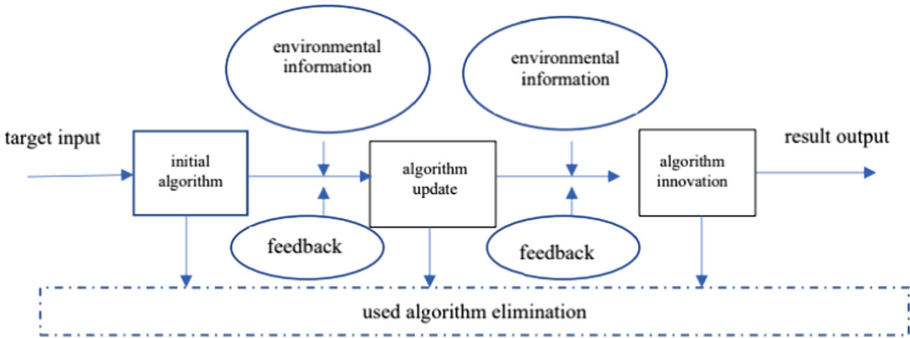


Fig. 2. Research on machine's internal behavior

3 New Perspective: Machine Behavior Transforms AI and Education

AI is the intelligence performed by machine, which is to imitate human behavior and their thinking. For example, learning and problem solving. Some AI algorithm can learn from data so that to strengthen itself and even write other new algorithm. All the time people research machine behavior as the founder, and pursue the methods of machine improvement, which is shown in Fig. 1. Computer scientists have made substantial progress in understanding AI system mechanism and development. But researchers pay less attention to AI systematic function and internal evolution. Nowadays, AI is becoming one important part of human society. A large number man-machine ethical issues arise and get resolved. Scientists should introduce the perspective of interaction between AI and external environment in order to research the macroscopic behavior law of machine and machine group.

Animal ethology involves four basic dimensions which are function, mechanism, development and evolution history. These dimensions provide organizational framework for machine behavior. The birth and development of machine behavior closely relates to social environment of algorithm and its function. Environment information can affect machine decision. Machine has the mechanism that produces internal behavior. The mechanism depends on algorithm and its environment, and integrate environment information into behavior so as to update algorithm. The updates would produce new functional outcomes that adapt to environment needs. Innovative applications of algorithm could spread in different machines. Understanding the change of machine behavior

along with the change of environment input is very important. The research on machine behavior provides us a new perspective of technology analysis.

AI technology depends on recessive skills, not dominant symbol operation. People sometimes do not know the rules of controlling complicated behavior. But it does not mean the rules do not exist. Research on the internal rules of machine operation and evolution would provide us a wider perspective of developing AI technology, which is showed in Fig. 2.

We can research the regular and internal connection of machine behavior from three perspectives. These are machine individual, machine group and mixed machine-person behavior. On the perspective of machine individual, machine's intellectualization provides thinking to algorithm innovation. Machine's self-regulatory mechanism makes machine getting the ability of self-adaption. On the perspective of machine group, the data sharing in different machines helps the construction of machine network. On the perspective of mixed machine-person behavior, machine's empathy helps learner obtain higher-order thinking and emotion.

3.1 Machine Intelligence: Construction of New Methods to Solve Practical Issues

Machine behavior perspective provides us new train of thought to view AI application from the perspective of machine itself. Through understanding machine behavior, researchers help people understand how algorithmic system works and supervise its possible successive consequence. Through the technical method, scientists can provide machine a circumstance in which machine could autonomously update and create actively. Machine intelligence does not mean technicalization. On the contrary, it means intellectualization. The intelligence technology has achieved a highly-developed level in hardware equipment and software preparation. But intelligent machine still has a large gap in intelligence level. Machine should think like human. And it should have human "feeling".

3.2 Machine Self-adaption: Strategy Adjusting to Meet Teaching's Need

Nowadays, one of the most popular AI applications in education field is personalized guidance to learners. But the so-called self-adaption and personalized learning is the privatization of learning process. Accordant tools are used to provide service to different learners. It seems like every learner is considered. But it is not real personalized teaching. Real AI technology should be adjustable according to learners' character and different needs. Through evolution, circumstance change and human policy decision, machine could 'remember' and 'reflex' so that it can adjust itself to adapt external changes.

Human brain could be regarded as the device of information operation according to formal rules. Similarly, machine can also operate information according to its own internal mechanism. Manual system produces adjustable problem-solving strategies through learning intelligence behavior.

3.3 Machine Connectivity: Systematic Technical Network

The technical analysis is not only the single design and update of numerous technical tools. Intact educational process needs a full set of technologies with different function.

Every technology has its own function. This brings about the division of technological use in intact teaching practice activities. In simple teaching practice activities, all intelligence technologies involve resource achievement, knowledge learning, interactive communication, evaluation feedback and other function requirements. Technological network suit to some given process (for example teaching practice) should be created to service the connection relationship constructed between different technological tools in the same process. Analyzing the connection relationship could help construct the link in technological services and share necessary data to realize the algorithm adaptation in different technological function.

3.4 The Machine Empathy: Advance Learners' Inner Emotion

In 21st century, learners need not only get the “hard” skills in science knowledge, but also “soft” skills, such as teamwork ability, creativity and communication. AI technology can provide massive educational resources and all-round visual knowledge, which provides a convenient route to cultivate learners' science knowledge and abilities. The main difference between human and machine is that machine do not have any mortal feeling. But this does not mean machine cannot help people gain mortal feeling. Actually, feeling is only one method that can lead human behavior to the beneficial orientation. In terms of machine, it is easier and more important once it helps the development of mortal feeling. Machine can take mortal feeling as one positive promotion and stimulation, and help its further development. At present, teachers still need to finish cultivating learner's innovation ability. But the future AI technology could cultivate learners' higher-order thinking ability. Therefore, AI technology should not only impart knowledge, but also stimulate and cultivate human's interest at important knowledge.

4 The Identity of Use and Its Effect

4.1 Remodeling Education Mission Which Should Focus on Cultivating Comprehensive Talents Who Meet the Development Requirements of AI Industry

Colleges should construct the mission of talents cultivation which all students must be training as a whole. This means that all students need develop all potency and personal capabilities. The talents specification in AI age is different with traditional industry. More and more human labor will be replaced by highly automatic and intelligent machines. Those talents who are good at only one kind of instrument or machine will be hard to find proper work position. Therefore, colleges should transfer orientation of talents cultivation. The concept of all-round development for AI talents should be set up in colleges. In the process of talents cultivation, the merge between professional education with AI discipline. Especially we should put cultural quality education on the same page with technical education. At the same time, the cultivation of vocational comprehensive capability should be pay more attention so as to promote students' all-round development of capabilities and character which can help students adapt multielement vocational environment and their personal development of long-term career.

4.2 Promoting the Transition of Educational Technology to Strengthen the Application of AI Technology in College Courses

Colleges should strengthen information construction to improve the standard of information teaching. The combination between AI technology and information technology is the typical character of AI education. So colleges should increase investment on information technology. On the basis of information construction, more AI education instruments and technological resources should be introduced to improve the standard of information and intelligence construction which can help the deep combination between AI technology and information technology.

4.3 Constructing Teaching and Learning Environment Which Matches AI Application

Colleges should promote the construction of intelligence campus. Intelligence campus is one kind of integration environment in which internet of things is the foundation linking work, learning and living. The construction of intelligence campus should depend on practical data and standard processing system. The needs of teachers and students must also be adequately considered. The management of intelligence campus usually begin from good top-level design. The planning and implement of top-level design obey systematic thinking and methods. Then the integrated framework which mixes AI technology with teaching, research, administration and campus life is constructed.

5 Conclusion

Machine behavior provides us a special perspective through which we can foresee AI application in educational field. It could cause diversion from education embracing AI technology to AI technology embracing education through researching machine internal execution and development. Researching machine behavior can make some given machine users' need come true. In the past we develop machine's implementation mode and action objectives through machine external environment. At present we could explore machine internal mechanism. The research object still is human needs and interest. This helps us ensure machine stay rational, friendly and ethical. This is AI technology's starting point, motive power and final purpose. Therefore, we construction future application scenario of AI in view of current AI iteration and update in educational field.

Acknowledgments. Acknowledge the financial support from 2020 Shanghai Education Science Research Program (No. C20134, Program host: Liu Wenhua).

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