

# The Ethical Dilemma of Artificial Intelligence and Its Construction of Moral Responsibility

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**Abstract:** *With the advent of the information age, the rapid development of artificial intelligence has accelerated social development and improved people's lives, but it has also generated a series of ethical problems such as algorithmic black box, privacy leakage, alienation of human relations. These ethical dilemmas urgently require the construction of artificial intelligence's moral responsibility. Establishing an ethic of responsibility for artificial intelligence and implementing moral responsibility is the key to addressing the issue of vulnerability in ethical dilemmas. From the three dimensions of personal responsibility, others' responsibility and social responsibility, the ethical issues of artificial intelligence are constrained and standardized, and the ethical concept of artificial intelligence moral responsibility covering the whole process from top to bottom is constructed. This overall moral responsibility view can not only alleviate the current concerns about the ethical issues of artificial intelligence, but also create a positive and healthy environment for the development of artificial intelligence, which is an important way to solve the problem of harmonious coexistence between human and artificial intelligence.*

**Keywords:** *Artificial Intelligence, Ethical dilemmas, Ethic of Responsibility, Moral Responsibility*

## 1. Introduction

It is generally believed that the essential difference between humans and animals lies in the manufacture and use of tools. In the process of human development, human beings have created countless tools and machines through their intelligence to make work more efficient and life happier, and artificial intelligence has been designed to be used for this purpose. But compared to previous machines, the autonomy of artificial intelligence has sparked debates about its technological and ethical aspects. This paper attempts to explore the current stage and dilemma of artificial intelligence, and hopes to establish a moral responsibility mechanism that can restrict the development direction of artificial intelligence in the controllable stage, so that artificial intelligence can flourish forward on the road that does not go against the original purpose of human creation and does not harm human interests.

## 2. Manuscript Preparation

### 2.1. Artificial Intelligence: From theory to practice

Generally speaking, Artificial Intelligence (AI) is a new type of technology based on computer science, which transforms human behavior and thinking patterns into numbers and programs applied to machines, by doing so, machines are endowed with intelligence that approximates human intelligence. Artificial intelligence can think, learn and solve problems, and its essence is to enable machines to better serve human beings and human society.

#### 2.1.1. Classification of artificial intelligence

At present, the academic circles generally agree that AI can be divided into three categories according to its degree of autonomy: weak AI, strong AI and super AI.

Weak AI refers to machines that do not have autonomous consciousness and have not reached true intelligence. Intelligent systems and intelligent tools such as face recognition, voice assistants and so on that are currently manufactured are weak AI, which only has human intelligence in one or some aspects. Due to the lack of autonomy and originality of weak AI itself, it can only appear in the image of

“instrumentalism” in life, serving as an assistant to help humans solve some problems.

Strong AI refers to machines that have an autonomous consciousness similar to that of humans and have achieved comprehensive intelligence. “Strong AI products have the ability to identify and control, and may either make independent judgments and autonomous decisions within the scope of the designed and programmed procedures, and realize the will of the designer or user; or go beyond the scope of the designed and programmed procedures, to make autonomous decisions and implement corresponding behaviors to achieve their own will.”<sup>[1]</sup> “Strong AI is divided into two categories: humanoid AI, which thinks and acts in a similar or identical way to humans, and non-humanoid AI, which has unique reasoning methods and is different from human thinking patterns.”<sup>[2]</sup> Super AI refers to an AI machine with super intelligence that surpasses human beings in all aspects, and is the final form of the autonomy of AI technology to reach a perfect state. While super AI is still in a hypothetical state, the academic circle generally believes that this is a possible development result. In 1998, Nick Bostrom, founding director of the Future of Humanity Institute at the University of Oxford, UK, defined super intelligence as “an intelligence that outperforms the human brain in almost every domain, including scientific innovation, generalist intelligence and social skills. This definition is open: the owner of a super intelligence can be a digital computer, a computer network integration, or artificial neural tissue, without regard to whether it has subjective consciousness or experience.”<sup>[3]</sup> For the understanding of super AI, the author believes that on the basis of Nick Bostrom’s definition of Super Intelligence, it is also necessary to ensure that the machine has subjective consciousness and experience. This means that if we do enter the era of Super AI, people will probably lose their mastery of AI.

### ***2.1.2. Development of Artificial Intelligence***

The idea of AI can be traced back to at least 17th century European philosophy, where Descartes and Leibniz proposed the idea of building a machine with human intelligence, and although they did not think it was possible to realize this idea, they clearly expressed the idea of “philosophy of artificial intelligence”.<sup>[4]</sup> In 1950, the “father of computer science” Alan Turing asked, “I propose to consider the question, ‘Can machines think?’ This should begin with definitions of the meaning of the terms ‘machine’ and ‘think’.”<sup>[5]</sup> Turing proposed the “Turing Test” to test whether a computer is intelligent, “To pass the test, the machine must be able to talk in a way that human interlocutors cannot distinguish their behavior from human behavior. AI researchers have tried and failed to build intelligent machines capable of meeting this requirement.”<sup>[6]</sup> In 1956, the Dartmouth Conference, initiated by John McCarthy and attended by more than a dozen scholars including Marvin Minsky, Herbert Simon and John Kemeny, scientists from the computer algorithms, logic theories, neural networks and other aspects of the discussion and for the first time to put forward the concept of “artificial intelligence”. After that, the scientific and philosophical circles began to study AI technology and philosophical issues.

In recent years, advances in science and technology have brought AI from theory to reality. In 1997, IBM's computer DEEP BLUE in the human-computer chess game for the first time to beat the chess master Kasparov.<sup>[7]</sup> In 2015, Google's AlphaGo Fan defeated the European Go champion Fan Hui by a big score; In 2016 and 2017, Google AlphaGo defeated world Go champions Lee Sedol and Ke Jie.<sup>[8]</sup> In 2017, the robot Sophia was granted Saudi Arabian citizenship<sup>[9]</sup> and other events have shown that the AI market is developing rapidly, and the scientific research results are constantly applied to practice, and the emergence of artificial intelligence has allowed society to move into a new period of development.<sup>[10]</sup> Since the 21st century, AI has ushered in an unprecedented good opportunity in research and application. High-quality talents and inclusive market environment have made AI technology develop rapidly. AI technology has crossed the “technological gap” between science and application, achieving major breakthroughs in natural language processing, image recognition, robot control, unmanned driving and other areas. Now, AI technology is combined with traditional industries to form the “AI+” model, such as: “AI+Education” “AI+Manufacturing” “AI+Medical”, etc.<sup>[11]</sup> AI is playing an increasingly important role in many fields, and its impact on society and personal life is increasing day by day. While enjoying the help brought by AI, human beings may also face great risks. Bill Gates has urged people to be wary of blind research and development of artificial intelligence, and Stephen Hawking has warned that “The development of comprehensive AI could mean the end of the human race”. Elon Musk made it even clearer that “we need to be very careful with AI, it could be more dangerous than nuclear weapons”, fearing that the development of AI could be the greatest existential threat to humanity.<sup>[12]</sup> Any technology will have both advantages and disadvantages when used. AI is moving from theory to practice, and as it continues to be applied AI greatly facilitates people’s lives, but more and more technical and ethical issues are surfacing. However, human beings will not stop the pace of research on AI technology. We should clarify the current dilemmas and explore

whether we can get solutions to the problems.

## **2.2. The Ethical Dilemma of Artificial Intelligence**

In the technological era of rapid advances in AI, Jonas pointed out that “it is precisely the well-being of technology (on which we are increasingly dependent) that contains the threat of turning into a scourge”.<sup>[13]</sup> As AI comes into work and life, people are showing a fanatical dependence on high technology, raising numerous ethical issues. The ethical issues of AI mainly revolve around three aspects: vulnerability in machine learning, human vulnerability and alienation of the human-machine relationship, generating negative impacts and risks that directly affect people’s lives.

### **2.2.1. Vulnerability in machine learning**

Vulnerability in machine learning refers to a series of problems caused by the complexity of the technology itself, including the need for massive data in machine learning, the existence of fraud in the data itself, the existence of an algorithmic black box for AI, and the subjective consciousness of the designer in the algorithm itself.

The development of artificial intelligence relies on algorithm design. “An algorithm is a method of input-process-output results that relies on data collection and machine deep learning.”<sup>[14]</sup> In the input link, AI design needs to analyze a large amount of data, and then convert it into programs and instructions to be input into the machine. In this link, there may be problems in the data itself, data invasion of privacy, data trading, and problems of selfishness in the algorithm design process of R & D personnel, which will lead to algorithm discrimination. Problems such as racial discrimination, gender discrimination, and price discrimination caused by algorithmic discrimination have seriously undermined the fairness of society. For example, the COMPAS criminal recidivism probability prediction system evaluates that the recidivism rate of blacks is twice that of whites, and Google’s algorithmic manipulation excludes competition, etc.<sup>[15]</sup> In the processing link, AI analyzes and learns the input information according to the set program, and outputs it as a specific result, acting according to the instructions of the result. In this process, the lack of interpretability of the algorithm black box will cause trust problems. In the output link, the self-learning ability of AI is difficult to calculate accurately, resulting in unpredictable algorithmic results.<sup>[16]</sup>

### **2.2.2. Human vulnerability**

Human vulnerability refers to the ethical problems caused by human beings in the design and application of AI, including the misuse of AI, the alienation of human relations caused by people’s over-dependence on machines, the unemployment caused by mechanization and autonomy, and the lack of responsibility of the relevant stakeholders of machines.

AI technology is widely used in many fields, with the help of AI in the work can help people efficiently deal with complex data and operations, but also reduce the time and energy wasted by simple and brainless repetitive work, but at the same time, it will also face problems such as job reduction and serious involution, etc. “From the current situation, most of the workers replaced by AI have a lower level of labour skills and are difficult to be re-matched to suitable positions in the job market within a relatively short period of time. The gradual increase in the penetration of AI will inevitably bring about an increase in the number of structurally unemployed people.”<sup>[17]</sup>

In daily life, AI’s accurate push and information screening can help people quickly find the information and data they need, and users can easily form a dependence on it, thus reducing and giving up thinking, greatly reducing people’s ability to identify and select massive data. And addiction to AI will also cause people to reduce their awareness of prevention, unconsciously leak personal information and privacy to the network, and be used by people with bad intentions, such as network fraud, accurate delivery of spam ads, theft of personal information, malicious marketing, etc. The use of AI has also led to the alienation of human relationships. Interactive dating through the Internet has shortened the gap of time and distance, online love, online red packets, etc., but back in real life, the interactions between people are becoming less and less rusty, and the traditional ways of communication and traditional customs gradually fade. This begs the question, if people return from the virtual to the real, will they still be able to act in compliance with the ethical principles of reality?

In recent years, all countries have attached great importance to the development of AI, and have formulated a series of laws, regulations and institutional norms for the research and development of AI. But if you want AI to flourish, you can’t just rely on mandatory legal norms, but you need the responsible subjects to assume moral responsibility, and how to improve the awareness of moral

responsibility is the core issue of AI development.

### **2.2.3. Alienation of the human-machine relationship**

According to the historical process of the development of human society, in the primitive agricultural era, human beings could only rely on primitive stone tools, animal bones, clay to make pottery, bronzes, or simple manual machines to carry out labour and solve the problems encountered in life and production. After the first industrial revolution, machinery replaced manual labour, and a large number of machines were created. Human beings make and use machines only as a tool, and human beings have an absolute dominant position on machines. However, with the development of information technology and the arrival of the intelligent era, the development of AI and other machines has caused this human-centred human-machine relationship to suffer. With the increasing degree of autonomy of AI, the controversy over the moral status of AI intensifies, and human subjectivity is threatened and challenged, “the idea that machines can match or even surpass human intelligence seems to challenge human status once again.”<sup>[18]</sup> The multidisciplinary and multidisciplinary nature of AI has led to an expanding range of applications and a gradual tendency to replace the role of human beings in different fields of work and life, further threatening the dominant position of human beings. The efficient and convenient characteristics of AI will also produce human dependence on it, and the use and command of humans to machines will unconsciously change to machines guiding humans to plan and arrange, and the dominant position of humans will become less firm. For the dilemma of human-machine relationship alienation, the academic circle has not come up with a unified new human-machine relationship standard and solution, but the contradictions and conflicts brought about by the alienation of human-computer relationship have gradually escalated.

At present, in the era of weak AI, with the development of technology, the degree of autonomy of AI will continue to strengthen, and the ethical dilemma caused by technology, humans themselves, human-machine relationship alienation and other problems cannot be perfectly solved in a short period of time. In order to minimize the negative impact of AI technology while exerting scientific and technological productivity, a sound system of moral responsibility for AI should be established before AI further develops into the era of uncontrollable strong AI, especially to solve the problem of moral responsibility attribution in the process of AI research and development and application, to enhance the controllability of the development of AI technology, and to guide the healthy and orderly development of AI technology.

## **2.3. Construction of Moral Responsibility for Artificial Intelligence**

As technology continues to evolve, the question of responsibility will eventually be ushered in, and it can be argued that the ethics of responsibility is the ultimate destination of technological applications. Responsibility ethics is the core of technology ethics.<sup>[19]</sup> “Of all the fields of applied ethics, none is so closely associated with the concept of responsibility as the ethics of science and technology.”<sup>[20]</sup> What are the criteria for determining moral responsibility? Can AI, as a special tool with autonomy, be morally responsible in its own right? Who should pay for the application of AI?

### **2.3.1. Prerequisite for ethical responsibility: autonomy**

On the issue of responsibility, Aristotle discusses in the *Nicomachean Ethics* that whether or not a person is responsible for his actions depends on whether or not he has acted voluntarily, out of ignorance, and has the capacity to be held responsible for his actions.<sup>[21]</sup> Although Aristotle did not provide a comprehensive theoretical system of moral responsibility, his thought is the fundamental to understand the issue of moral responsibility.<sup>[22]</sup> The classical moral responsibility school inherits Aristotle’s thought, believing that voluntariness and freedom are the basic premise of responsibility, and autonomy is an important criterion for judging responsibility. With the rapid development of modern science and technology, AI has a certain degree of autonomy and will continue to improve. Although the academic community has a slightly different understanding of the autonomy of artificial intelligence, it is generally recognized that we are still in the era of weak AI with an extremely limited degree of autonomy. George Bekey believes that autonomous robots are intelligent machines that can perform tasks on their own without explicit human control, and most robots today fall short of the criteria for full autonomy.<sup>[23]</sup> Moreover, current AI technology relies on algorithmic logic, where scientists and designers specify morality as data and procedures built into machines, enabling them to make moral judgments and act in accordance with moral principles. But this is faced with the following problems: Both the intuitionist ethics, which holds that morality and moral judgments rely on innate intuition, and the empirical ethics, which holds that moral sense is formed from experience, show the

complexity of moral principles, and can they be accurately coded into machines through computation? Even if the problem of built-in morality can be solved, how can a suitable set of moral principles be identified for AI when there are no uniform moral principles in different countries and societies? Even if a set of criteria can be selected, there are still ethical issues such as discrimination caused by algorithmic black boxes. How to ensure that the moral principles of machine learning do not have selfishness? From the above discussion, it can be seen that AI mainly obtains autonomy based on ethical principles determined by human computation and design, so as to make moral judgments. AI only operates according to pre-set procedures, and cannot understand the meaning of morality, nor can moral behavior correspond to morality. When faced with complex moral judgments and moral choices such as the “Trolley Dilemma”, AI may not be able to make decisions with the same values as those of human beings, so how can it be held accountable? For some time, AI will be nothing more than artificially designed intelligences. Therefore, it is difficult for AI to be responsible for its own safety and reliability.

### ***2.3.2. Implementing ethical responsibility for AI: Who is responsible for AI?***

As the degree of autonomy of AI increases, the controversy about whether artificial intelligence has moral consciousness, moral status and moral responsibility is intensifying, but even the most influential “Turing test” that can prove the autonomy of AI still has a lot of flaws. Some scholars believe that AI is only “human intelligence” given by people according to their own understanding, rather than a new intelligence generated by the machine itself. At present, there is still no theory that can prove that AI has moral consciousness and moral status in academia. Regardless of the autonomy of AI, human beings are the only subject of moral responsibility, and the ethical problems caused by the application of AI should be responsible for human beings. It is difficult for machines to take responsibility for their actions, and even if they do, it is difficult to repair the damage caused. So who is responsible for the ethical problems of AI?

Artificial intelligence developer: Firstly, before conducting research on AI, AI developers should establish a risk awareness, make reasonable predictions and assessments of the possible risks of the machine, and establish forward-looking moral responsibility to be responsible for the possible consequences. Secondly, during the AI design process, AI developers should reduce their own subjective biases in order to promote AI with fair values embedded in it. Finally, before the AI is put into production, the AI developer team should sort out a clear principle and process of the overall operation of the machine, AI in the application of technical problems can be found to cope with the programme to reduce the risk of the use of the process.

Artificial intelligence development enterprises and regulatory agencies: AI as one of the hottest technologies nowadays, widely used in life and work, good prospects for the development of artificial intelligence development enterprises to bring lucrative profits, more and more enterprises have launched research on AI, but enterprises usually put the pursuit of technological profits in the first place. Excessive profit-seeking will likely lead to a gradual decline in moral binding. At present, most of the AI development enterprises have ethical problems such as eavesdropping on users’ privacy, collecting users’ information and trafficking data, identifying errors, identity discrimination, content falsification, inappropriate speech, etc. Various safety issues occur frequently, and enterprises should take legal responsibilities while actively and voluntarily assume moral responsibilities to guide the development of AI technology in a good direction, and reduce the occurrence of accidents and negative effects. At the same time, AI development enterprises should also be subject to external supervision, establish a professional regulatory agency independent of third parties other than AI development enterprises and users, on the one hand, the application of AI for safety testing to reduce the possibility of accidents; on the other hand, the responsibility of AI accidents is identified to ensure the fairness of responsibility. As an independent third party, AI regulators need to assume the moral responsibility of fairness and justice to promote the orderly development of AI.

Artificial intelligence user: The technology itself is neutral and AI does not have the capacity to assume moral responsibility, just as the company is responsible for its legal representative, and an infant or child is responsible for its guardian before it has the ability to bear moral responsibility, “when AI becomes the object of the user’s attention, the user is both the subject of the act of using it and needs to assume responsibility for the AI”.<sup>[24]</sup> Therefore, users should be held responsible for the ethical problems caused by the excessive misuse of AI.

In summary, some of the ethical issues brought by AI, AI developers, AI development enterprises and regulators, and AI users should establish the concept of moral responsibility, reduce the potential risks of AI, and promote the high-quality development of AI.

### 2.3.3. Symbiotic coexistence of the overall concept of moral responsibility

Moral responsibility includes personal responsibility, others responsibility and social responsibility. According to the principle of symbiosis and coexistence, in the era of AI, everyone should use AI technology on the basis of taking responsibility for personal behavior and consciously assuming moral responsibility for others and the collective, so that AI can better serve people in the development process, reduce the risk of accidents, and ensure the orderly operation of society. Jonas's ethics of responsibility states that “the scope and time span of the impact of scientific and technological activities have far exceeded the vision and control of the individual researcher, and the traditional moral responsibility based on individual direct relationships is no longer able to cope with this situation, and a holistic view of ethics of responsibility should be advocated. In his view, moral responsibility is concerned with the survival and well-being of the human race as a whole, and is the responsibility of the individual for the overall destiny of the human community.”<sup>[25]</sup> All relevant stakeholders in the research and application of AI technology, as the main body of common responsibility, should follow the principle of symbiosis and coexistence to jointly assume moral responsibility, and formulate a detailed moral responsibility allocation plan on this premise.

### 3. Conclusions

By reviewing the development process of artificial intelligence (AI), we can clearly recognize that the ethical issue of AI is a long and complex issue. Nowadays, the rapid development of AI has gradually penetrated into various fields of life, and it is urgent to make corresponding research on moral responsibility construction to address the ethical dilemmas that arise. In summary, the author believes that in view of the current development status of AI, AI is still not enough to independently perform moral responsibilities, and the behavior of artificial intelligence is still carried out by the procedure set by human beings. AI is essentially a tool or machine that serves human beings, which can execute moral commands, but cannot understand the moral meaning behind them. AI lacks moral perception and awareness, makes moral choices, and assumes moral responsibility. It has not completed the leap of autonomy. Therefore, it is still too early to continue discussing the moral subjectivity status of AI. From the results, AI replacing jobs is only to liberate productivity, making productivity higher and safety higher, and AI interaction is only an auxiliary tool with higher efficiency and wider content coverage. Therefore, AI technology is still serving people and is for human purposes. Since it is a technology, the ethical issues about Artificial Intelligence should return to the ethics of technology itself, where moral responsibility is to be observed and shared in the ethical relationship between humans and technology. The key to establishing a correct moral outlook and establishing a good ethics of responsibility lies in implementing it into people themselves, because AI is developed and created by humans. Correctly handling the relationship between humans and AI, putting AI in the right place, can better clear obstacles and provide value guidance for the development of AI.

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