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The Research Advance in Ethical Issues of AI Application

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Abstract:

The topic of AI has become more and more discussed ever since the release of ChatGPT, as its astonishing intelligence has made humans to challenge the boundary. This vagueness then contributes to the emergence of discussions on the ethics of AI. Aiming to clarify the many current academic discussions on the ethics of artificial intelligence and to recognize different ethical perspectives, this study conducts a literature review of the research and discussions among different scholars on ethical issues in the application of artificial intelligence technologies. It is found that the current relevant discussion extends from a micro perspective emphasizing the individual to a macro perspective emphasizing the human race. Research advances on ethical issues in AI applications can be categorized into three levels: personal, social, and global. Among which, the individual level focuses on the ethical issues in algorithmic logic and user data management. The social level focuses on the social employment and public accountability systems. While the global level discusses intellectual property disputes and the social identity of AI robots. Finally, the author gave an evaluation of the gaps and challenges of studying AI ethics and emphasize the importance of addressing ethical issues in AI development and deployment. The paper aims to serve as information for scholars and policymakers, fostering ethical awareness in the AI research community and helping AI technologies to be developed and used responsibly.

Keywords: AI; ethics; technology; literature review.

1. Introduction

The unprecedented development of artificial intelligence (hereinafter: AI) has brought humans into the era of digitalization and auto-mobilization. As AI-facilitated systems become more and more indispensable in area like policymaking, humans have realized that their influence has expanded beyond sheer technology advancement. Undeniably, the integration of AI has greatly changed social structures and provided myriad conveniences to humans. The use of AI in health application, for instance, has effectively brought a healthy lifestyle to its users [1]. Apart from the benefits, however, the application of AI has brought a series of challenges. Privacy issue, security concern and potential bias in AI decision-making have now arisen. Under such circumstances, the research on ethical issues of AI applications is of great importance. Technical ethics are the moral principles needed to guide development, application and the distribution of technology. They assure the technical advances are aligned with the value system of human societies, and contribute positive effect to the welfare of the whole humanity. More and more academic work has now started to tackle the ethical issues of AI, as well as exploring complexed topics such as the injustice of algorithms, the privacy of data, and other influential social issues. This blooming interest has shown the complexity of making ethical considerations in a world becoming more and more AI driven each day. The ethical problems of science and technology in the application of artificial intelligence are worthy of in-depth and specific research.

This research aims to provide a systematic and thorough review of academic works on the ethics of AI application. Through combining the main arguments in the academic field with the latest research progress, this research strives to provide an in-depth analysis and summary of the existing discussions on AI ethics. In addition, based on the previous research, this research also contemplates the future interaction between human society and artificial intelligence technology. The motivation behind this research originates from the pressing need to comprehend and address the ethical challenges posed by artificial intelligence, ensuring that its development and application adhere to ethical standards while contributing to societal improvement. By describing the ethical considerations associated with AI applications, this study aims to inform decision makers, guide the ethical design and deployment of AI systems, and foster a more ethically aware AI research

community. By doing so, it hopes to pave the way for the responsible development and use of AI technologies in the future, enhancing their potential to serve the greatest benefit of humanity.

2. Progress in Ethical Issues of AI Application

So far, the academic community has been very rich in the study of technical ethics in the application of artificial intelligence, and a variety of opinions and discussions have been formed, which has laid a solid research foundation for the research in this field. Specifically, relevant research can be summarized at three levels: individual, social and global. The following will be a detailed discussion of the views of the three levels.

2.1 Individual-level Ethics

At the personal level, existing studies believe that the generation of technical ethical problems in the current application of artificial intelligence mainly comes from the logical algorithm of machine learning and user data management. Among them, the ethical problems caused by machine learning reflect the human subjective initiative in the process of algorithm design. The risk of user data management is an unavoidable objective risk that comes with the development of AI technology.

2.1.1 Human factors

In terms of human factors, some studies have found that AI machine learning algorithms are designed by humans, reflecting human subjective initiative. This may lead to ethical problems of technology due to human cognition and technological limitations. Machine learning is a branch of computer science that enables computers to improve themselves without manual reprogramming. To do so, computers, in this case artificial intelligence, would learn from practice as well as experience [2]. Problems arise as researchers find that certain algorithmic biases emerge as machines learn. A case study of semantic representation bias in bio, for instance, tests the gender bias in occupation classification of three different machine learning models. The results of this research have indicated that biases in the mechanism of machine learning could potentially lead to further underrepresentation of gender groups in occupations where they are already underrepresented [3]. This algorithmic bias is also proved elsewhere. In a study on the political bias in artificial intelligence systems, he noted a tendency of AI developers to include their political viewpoints implicitly when labelling AI training data, which would therefore lead to further bias embedded in the algorithms [4]. The ultimate source of these different forms of bias could be concluded through three channels: the mislabeling of AI training data, the underrepresentation of social groups, as well as the reflection of existing inequalities in the society [4].

2.1.2 AI factors

In terms of objective factors, many studies have pointed out that with the popularity of AI products, their users' personal privacy and data security is inevitably at risk. This suggests that some data of users may be analyzed by AI without informing the users in advance. Though such analysis may be out of good intentions, still, the lack of consent brings out concerns on the abuse of privacy. Through the semi-structured interviews conducted with political figures in Spain, Saura, Ribeiro-Soriano, and Palacios-Marqués bring out the problem of government sacrificing the privacy of citizens to optimize the decision-making process during COVID-19 pandemic [4]. The similar case is seen in healthcare applications as well. According to Kühler, it is determined that the artificial intelligence embedded in healthcare applications may promote the well-being of users without the user even noticing it. The application may, for instance, identify food intolerances that the user themselves is unaware of, which further undermines the user's autonomy [1]. Furthermore, the lack of transparency of AI is also a source of ethical concerns. In a 2019 study of the transformation of machine learning conducted by Arun Rai, it is noted that one class of machine learning would prioritize prediction accuracy over transparency [5]. This class is widely used in multiple types of biometric recognitions [6]. The application of this technology in the field of multi-type biometrics has exacerbated the problem of user data transparency being ignored.

2.2 Societal-level Ethics

From the social level, existing research focuses on the social employment and public accountability system problems caused by the application of artificial intelligence technology, which may lead to technological ethical risks. Among them, the employment problem is mainly reflected in the short-term unemployment crisis caused by the large-scale popularization of artificial intelligence. Accountability risk is mainly manifested in the lack of accountability system of artificial intelligence technology.

2.2.1 Economic impact

From the perspective of social economy and employment forms, some studies predict that the development of artificial intelligence will have an impact on labor employment, especially, making middle-aged workers with lower education level face unemployment in the short term.

That could spark a labor movement against AI technology. Using panel data from 33 OECD countries, a study in 2022 examined the relationship between AI, robots, and unemployment. Its findings indicate that both AI and robots tend to increase unemployment. When they reran the regression analysis based on unemployment rates by education level and age group, they observed significant variation in the effects of AI and robots. Some impacts identified at the aggregate level, such as the effect of robots on unemployment among those with the lowest education levels. These impacts appear to be concentrated in specific age groups, particularly 25-34 age group [7]. However, this study only illustrates the short-term effect of AI application, which makes it unreliable when considering the job market more than 3 years ahead.

2.2.2 Accountability issues

From the perspective of public accountability, due to the characteristics of artificial intelligence technology and the lack of supervision, it has spawned a large potential techno-ethical risk based on social accountability. There is now an urgent need to establish a mechanism that holds people accountable for potential societal impacts of AI. According to Novelli, Taddeo, and Floridi, the technological properties often make the outcome of AIs opaque and unpredictable, hindering the detection of causes and reasons for unintended outcomes [8]. Taking the car crash of a driverless car. The cause of this car crash could the result of many different factors integrating together: a system bug, a blank space in training data, the aging of a car component. This then problematizes the question of who is exactly liable. Ultimately, an accountability gap is formed, meaning that when a damage is found, it could be difficult to ensure accountability for violations of those responsible [9].

2.3 Global Ethics

From the perspective of global governance, existing studies believe that the current techno-ethical issues in the application of artificial intelligence are mainly manifested in two aspects, such as intellectual property disputes and the social identity of AI robots. Among them, the legal protection of intellectual property is not perfect, which may lead to the ethical dilemma of technology; However, the identification of artificial intelligence robot's personality is easy to cause ethical concerns of social identification.

2.3.1 Intellectual property issues

When considering the ethical issues of AI application at global level, the debate on whether or not such intelligence could possess intellectual property rights naturally appears. The reality of AI and intellectual property is that there is not yet a determined conclusion on the legal protection of AI's intellectual property. Researchers and practitioners in different countries and regions hold different views on whether intellectual property rights of artificial intelligence products should be recognized. In Indonesia, for instance, artificial intelligence is treated as an object that is not accountable for intellectual property in its Patent Law. However, in the Copyright Law, AI is instead considered as a participant in the creating process, which dismisses AI's role as an object [10]. The similar debates also appear in the academic world. While some scholars deny the intellectual property rights through an anthropocentric stand, others focus on dismissing the premise of human labour behind granting intellectual property rights. Hilty, Hoffmann, and Scheuerer, for instance, have sought to refute the labour theory of people are entitled to such rights since they are "fruits of their own labor". They argue that AI has also put work into producing results, which dismisses the necessity of a human link to such theories [11]. However, their justification is only one side of the debate. The problematic topic has not yet wound up, which leaves room for future discussions.

2.3.2 Different debates on personhood of AI

Should AI have the same social identity as humans? This is an important topic on the ethics of artificial intelligence technology on a global scale. In other words, the issue is about how humans perceive the social function of an AI robot: as an efficient tool, or as a robotic creature with a social personality. According to Brown, supporters of the latter side have argued that problems would arise as AI grows stronger and obtains unpredictable power in which humans could fail to respond to. However, critics then refute by claiming that there is little chance that such strong AI could be developed [12]. Overall, the debate is still ongoing, with different viewpoints having their own reasons. Margret Archer, for instance, has considered AI as qualified for personhood since AI has met the three necessary conditions of personhood through their cooperation with humans [13]. Nevertheless, Gordon argues that existing AIs still have technological limitations that make them far from real people [14].

3. Summary of Existing Researches

Overall, the research papers on the ethical issues of artificial intelligence applications represent a dynamic and rapidly evolving field. In general, the academic community has a rich discussion on the technical ethics of artificial intelligence, and many research results have been formed. The existing research can be summarized into three levels: individual, social and global. Discussions of AI ethics in

politics have been popular at both individual and societal levels [4]. In medical field, scholars have also achieved great progress in the ethical issue, and have provided very detailed analysis in this area [5]. For example, the use of AI technology in clinical medicine, the management of AI nurses, and the collection of patients' personal privacy data. Nevertheless, the most prevalent category of academic studies in AI ethics appears to be reviewing that summarize the progress in a general scope. The problem then arises, however, as the literature being used in such reviews is usually too outdated to be reliable in the modern day where AI progresses in just a blink of an eye. Certain theory, such as the black box theory, is from as early as the end of the twentieth century, yet is still used to support the lack of transparency in machine learning. Technology has surely changed disruptively since then, which proves the unreliability of the theory under the modern context. Moreover, little research has been done on the ethics of human-AI co-creation. Possible topics may include investigating AI in the field of education. This area is of great importance considering the popularity of AI art generators. Therefore, further studies are still needed to cover this area of great significance.

4. Perceiving and Using AI with Openness and Positivity

Personally, although the current technical ethics discussion on the application of artificial intelligence is very popular, and artificial intelligence technology often has some problems in practice, the discourse on ethics of AI appears to be overestimating the damage that AI could do to the human world, with a disproportionate amount of concerns both outside and inside the academic world. The author therefore believes that it is such negative attitudes that are the cause of people reducing AI to sheer tools. Apparently, this intelligence is still in its beginning phase, which suggests that it possesses unpredictable potential. Instead of restraining it so urgently, the fear should rather be transformed into an open attitude to test the boundaries of humanity, as if AI is part of a thought experiment. By testing such limits, the human race could be even more united, knowing they are sharing something that is most definitely irreplaceable.

However, the current economy may not yet be prepared for this experiment, which calls for the need of tackling some current ethical issues to establish a foundation. In order to do so, education is the primary necessity This education not only includes training developers of AI to follow the law, but also acquire teaching the general public to use AI properly. In the past few years, events of AI being used maliciously have appeared. Ayyub, an Indian woman, was a victim of such events in 2018. Her face was stitched to a female porn star in a video on a pornography website [15]. Through education, the public may become more aware of the dangers of AI, thereby reducing the incidence of such cases and ultimately partially addressing concerns about the safety of AI.

5. Conclusion

In short, research into the ethical application of AI reveals a range of challenges to integrating AI into every aspect of human life. Through the literature review of the existing technical ethics issues on AI applications, this study has summarized the relevant views on individuals, social, and global ethics, and investigated the complexity of algorithms and privacy issues as well as the broader implications of AI for human society. The study highlights the importance of addressing ethical issues in the development and deployment of AI technologies. By investigating potential biases and the social implications of applying AI and providing an important foundation for the research needed by developers, developers and decision-makers to ensure that systems meet the ethical standards of AI and promote social welfare. The researcher also stressed the need for continued vigilance and positive action to eliminate ethical issues related to AI and create a more ethical community to study AI. Future research on the ethics of AI will address new questions, such as the impact of AI on new areas such as self-driving cars, advanced medical technologies, and AI-powered decision-making processes. More important is the in-depth development of a standardized ethical framework and organizational structure that can effectively regulate the use of AI in different applications. By considering these areas, future research may help develop responsible AI technologies and ensure that they maximize their potential to benefit humanity while supporting ethical values.

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