Exploration of Ethics in the Development of Artificial Intelligence: A Literature Review on Social and Moral Implications

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Abstract. This research aims to explore the ethical dimensions in the development of Artificial Intelligence (AI) with a focus on its social and moral implications. The research method involves a literature review to gain a profound understanding of the social and moral impact arising from AI development. Analysis is conducted on various literature sources, including articles, books, and AI-related ethical initiatives. The Future of Life Institute highlights the significant potential of artificial intelligence across various sectors but also underscores significant ethical challenges. This initiative requires careful understanding and handling to ensure that AI development aligns with moral and social values. Ethical issues related to unfair compensation for workers in the 'mechanical turk' industry and the impact of technology companies on human rights and democracy are identified. Furthermore, the research describes ethical issues in the use of personal data to train AI models, emphasizing individual rights regarding trained models and the protection of data subject identities. Additionally, the relationship between humans and robots raises ethical questions about their influence on human values and the potential for violent impacts. This exploration also discusses AI-related ethical initiatives emphasizing human rights, well-being, accountability, and transparency. The Ethically Aligned Design Guidelines from IEEE serve as a primary reference, emphasizing the need for AI development based on ethical principles and human rights. In conclusion, this research underscores the importance of awareness regarding the social and moral implications in AI development. Moral principles such as openness, accountability, justice, security, and freedom serve as guiding principles to ensure that AI provides positive benefits without sacrificing human values.

Keywords: Ethics, Artificial Intelligence, Social, Moral.

1. INTRODUCTION

Interaction with humans triggers nearly all the ethical issues under investigation. Currently, all AI and robots can only perform a specific task, exemplifying what is referred to as Narrow AI. The long-term goal in AI and robotics research is to achieve Artificial General Intelligence (AGI), on par with human intelligence (Asrol & Rifma, 2022). Although Narrow AI often surpasses the abilities of most humans in specific tasks, such as chess games, search engines, or natural language translation, versatile robots capable of performing various tasks, such as caring for the elderly, are not yet the main focus of research (Firnando, 2023). Machine learning is a term that refers to AI's ability to learn or, in the context of robots, adapt to their environment. There are two main categories in machine learning approaches: supervised and unsupervised. Supervised learning systems typically use Artificial Neural Networks (ANNs), trained by providing input (e.g., images of animals) to labeled ANNs (by humans) with corresponding outputs (e.g., giraffe, lion, gorilla). On the other hand, unsupervised learning does not require training data; instead,

AI or robots must figure out how to accomplish a specific task on their own, usually through trial and error (Firdaus et al., 2023).

Supervised and unsupervised learning approaches have their respective limitations. With supervised learning, the training data set must reflect the desired task; otherwise, AI may exhibit bias. Unsupervised learning, while more powerful, is generally slower (compared to humans who can learn from a single trial) and carries the risk of producing errors unforeseen by human designers (Sihombing, 2023). For instance, AI may misidentify a car with a snowy background as a wolf because examples of wolves in the training data set have snowy backgrounds, and the AI learns this association.

The Artificial Intelligence Communication from the European Commission (European Commission, 2018) provides a definition for artificial intelligence as a system that exhibits intelligent behavior by analyzing its environment and taking actions to achieve specific goals, with a certain level of autonomy (Jenita et al., 2023). AI systems can be software operating in the virtual world, such as voice assistants, image analysis, search engines, and voice and face recognition systems, or embedded in hardware such as advanced robots, autonomous cars, drones, or Internet of Things applications (Prakoso, 2023). The term deep learning, in this context, refers to machine learning systems typically supervised using layered Artificial Neural Networks (ANNs) and large training data sets. It is important to note that the terms AI and machine learning are not always synonymous, as many high-capacity AI and robot systems do not use machine learning.

Ethics is a set of moral principles governing individual behavior or the implementation of an activity. A practical example of ethical principles is the respectful treatment of all individuals. Philosophers have debated ethical issues for centuries, with famous principles such as Kant's categorical imperative, stating 'act only according to that maxim whereby you can at the same time will that it should become a universal law,' being one of the most renowned (Dewanto, 2023).

Ethics in the context of Artificial Intelligence (AI) involves crucial questions about how developers, producers, and operators should behave to reduce ethical risks that may arise from the use of AI in society. This includes concerns about poor design, improper implementation, and AI misuse (Rahmawati et al., 2023). Ethical issues in AI encompass data privacy and bias in current AI systems, short and medium-term impacts on jobs and workplaces, as well as long-term concerns related to the potential for AI to reach or surpass human capabilities (superintelligence).

In recent years, AI ethics has shifted from academic attention to political and public debate. The increased use of smartphones and AI-based applications, the impact of AI on various sectors, and the prospect of an AI arms race have prompted various initiatives from NGOs, academic groups, industries, professional bodies, and governments (Insani et al., 2023). These initiatives include the publication of various ethical principles for robotics and AI, the emergence of new ethical standards, as well as various AI strategies from countries and groups of countries. This research aims to survey these initiatives to identify key ethical issues related to AI and robotics.

2. RESEARCH METHOD

This research aims to conduct an in-depth exploration of the ethical aspects in the development of artificial intelligence (AI). The research method employed is a literature review with a qualitative approach to gain a profound understanding of the social and moral implications of AI development. The study involves the analysis and synthesis of articles, books, and other literature sources related to the topic. The first step in this research is to identify relevant literature sources regarding ethics in artificial intelligence. These literature sources may include scientific journals, books, conferences, and other related writings. Literature selection will be based on specific criteria such as research methodology quality, relevance to the research topic, and contributions to the understanding of ethics in artificial intelligence.

After identifying relevant literature, the research will involve an in-depth analysis of the content. Qualitative analysis will encompass the identification of main themes, trends, and conceptual frameworks emerging from the literature. The primary focus will be on the social and moral implications of AI development, including its impact on privacy, justice, and societal moral values. The research will also consider different perspectives from researchers and ethical thinkers in artificial intelligence. This will aid in understanding the diversity of views related to emerging ethical issues. The conclusions of this literature review will include synthesizing key findings, identifying knowledge gaps, and providing recommendations for further research in the field of AI ethics. Using a qualitative literature review method, this research is expected to offer deeper insights into the ethical aspects of AI development and identify potential research directions to address emerging ethical challenges in this context.

3. RESULT AND DISCUSSION

According to the Future of Life Institute (n.d.), artificial intelligence (AI) has significant potential across various sectors such as the economy, social sphere, medicine, security, and the environment. Its potential benefits include several key aspects. Firstly, AI can assist society in acquiring new skills and training, supporting more effective human resource development. Additionally, AI can play a role in the democratization of services, broadening access to various services and information. Faster production speed and iteration cycles can be achieved through AI implementation, enhancing efficiency and innovation across various sectors. Moreover, AI has the potential to reduce energy consumption and provide real-time environmental monitoring, offering solutions to pollution issues and air quality monitoring (Ibrahim et al., 2023). In the security context, AI can enhance cybersecurity defense, while in the economic sector, AI is expected to boost national output and reduce inefficiencies in healthcare services.

Other positive aspects include AI's ability to create new enjoyable experiences for society and improve real-time translation services to connect people globally. In the long term, AI is considered capable of making breakthroughs in various fields, from basic and applied sciences to medicine and advanced systems (Marlin et al., 2023). Despite its immense potential benefits, the Future of Life Institute emphasizes that increasingly capable intelligent systems also pose significant ethical challenges. Therefore, a careful understanding and handling of ethical aspects in the development and implementation of artificial intelligence are crucial to ensure its positive impact aligns with moral and social values.

Ethics of Application and Development of Artificial Intelligence (AI)

The development of artificial intelligence (AI) often involves data management and data cleaning to instruct training algorithms. In the context of better and safer AI development, a large training data set is required, leading to the emergence of a new outsourcing industry worldwide to meet these needs. This phenomenon creates several new job categories, such as scanning and identifying offensive content, manually labeling objects in images, and interpreting questions that are difficult for AI chatbots to understand (Nuraziza & Sudirman, 2024). These tasks, collectively known as 'mechanical turk,' refer to human efforts in supporting the development of artificial intelligence. Such tasks were initially offered as a way for individuals to earn additional income in their spare time. However, this phenomenon has evolved into on-demand work worldwide, involving more than 20 million people through third-party contractors (Safina et al., 2024). This work is

often conducted outside the framework of labor laws, with tasks scheduled, directed, delivered, and paid for online through application programming interfaces (APIs).

In connection with the exploration of ethics in the development of artificial intelligence, the 'mechanical turk' phenomenon highlights several ethical issues that arise in the AI development value chain. One major issue is the unfair compensation for workers, especially when jobs are performed outside the EU or the US, such as in the growing 'data labeling' industry in China and Kenya. Workers also face tasks of checking offensive content on social media platforms, posing potential risks to mental health and poor working conditions. The importance of making worker input more transparent in the final product, ensuring fair benefit distribution, and providing proper support structures for those dealing with psychologically harmful content becomes a crucial step in addressing emerging ethical issues (Nur et al., 2023). In the context of literature review on the social and moral implications of AI, it is important to consider how the role of these workers can be ethically integrated and how AI development can reflect moral values in supporting sustainability and fairness.

Nemitz highlights his concerns about the impact of new technologies, such as artificial intelligence (AI), on human rights, democracy, and the rule of law. He emphasizes that technology companies, as key players in AI development and implementation, have the power to shape not only technological advancements but also the debates surrounding their regulations. The main factors identified by Nemitz in the use of power by technology giants involve finances, public discourse, and the collection of personal data. First, in terms of finances, major technology companies have the ability to invest heavily in political and social influence. They can acquire new ideas and start-ups in the AI or other relevant fields according to their business models (Raharjo, 2023). This can be detrimental to diversity in innovation and technological development.

Second, concerning public discourse, technology companies control the infrastructure where public discourse occurs. Sites like Facebook and Google become primary sources of political information for citizens, especially the younger generation. This can result in the decline of the role of fourth estate and traditional media, as well as the elimination of major revenue streams from the news industry. Third, technology companies collect personal data for their own benefit, creating profiles of individuals based on online and offline behavior. They have greater access to personal information than we have about ourselves or our friends. The use of this data for profit, surveillance, security, and election campaigns becomes a significant ethical issue.

Nemitz concludes that the accumulation of power in the hands of a small group of people in financial, public discourse, and personal data aspects should be viewed together. This underscores the need for public engagement in ethical and legal debates regarding AI, given the potential consequences. Bryson, on the other hand, adds another dimension to the discussion by stating that this concentration of power could be an inevitable consequence of the declining cost of robotic technology. In the context of low costs, a few companies can dominate the market, potentially harming diversity in the economic system (Insani, Khoirunnisa, & Herlambang, 2023). Overall, both Nemitz and Bryson highlight the ethical consequences of the dominance of technology companies in the development and implementation of artificial intelligence. This discussion is related to the exploration of ethics in the development of artificial intelligence, particularly in the context of the social and moral implications of highly centralized control in AI technology development.

The development of artificial intelligence (AI) involves not only the collection of personal data but also raises a number of ethical issues related to control, privacy, and the rights of data subjects. Personal data used in training models can be reconstructed from the model, raising questions about individuals' rights to the trained model (Muhammad Ibrahim et al., 2023). While individuals have limited rights over their personal data, trained models are often governed by intellectual property rights, such as trade secrets. Ethical issues arise concerning the level of control subjects have over the data collected about them. Should individuals have the right to use or at least know the use of the model, given their interest in training the model? These questions become relevant considering the lack of rights or obligations for model-related data protection after the model is created, before decisions are made regarding its use.

Additionally, other ethical issues involve the protection of identity or personal information of data subjects involved in training the AI model. Veale and colleagues (2018) propose extra protection for these individuals, including the right to access the model, know the origin of the data, and the right to delete themselves from the trained model. This becomes increasingly important considering the risk of identification through cyber-attacks that can reveal personal information about data subjects. In connection with the exploration of ethics in the development of artificial intelligence, these issues highlight the need to consider the social and moral implications of using personal data in AI model training. Ethical discussions need to encompass how individual rights can be preserved, to what extent control can be given to data subjects, and efforts for better identity protection in the context of AI technology development.

The Relationship between Humans and Ethical Principles in Artificial Intelligence

The relationship between humans and robots raises various ethical issues that need exploration, especially in the context of artificial intelligence development. One ethical question that arises is whether robots can alter human beliefs, attitudes, and values regarding human relationships. The possibility of having a "perfect" relationship with a robot could impact human engagement in interpersonal relationships, potentially making them less patient and unwilling to face existing challenges. Another ethical issue relates to the potential increase in violent behavior resulting from interactions with 'intimate' or 'sexbots.' Some researchers speculate that the use of 'sexbots' could alter societal perceptions of human values and increase the desire to harm others. Ethical questions arise about whether violent actions against robots could normalize behavioral patterns that could ultimately harm other humans (Sihombing, 2023). However, there is an argument that robots could serve as an outlet for sexual desires, potentially reducing the risk of violence or aiding in recovery from assault.

In the context of exploring ethics in the development of artificial intelligence, considerations regarding the moral rights of robots become relevant. Some artificial intelligence and robotics experts reject the concept of granting legal status or moral rights to robots, especially those considered 'autonomous,' 'unpredictable,' and 'self-learning.' This is proposed to prevent the loss of moral responsibility, accountability, and legal liability related to potential errors and misuse that may arise in human-robot interactions. From an ethical standpoint, granting moral rights to robots may be considered unethical, as it could place robots in competition with humans, make them suffer, or render them unnecessary entities (Jenita et al., 2023). As a result, ethics in artificial intelligence development needs to specify the limitations and ethical principles guiding human interactions with such technology, avoiding granting moral rights that could have negative impacts on human values.

Ethical Initiatives in Artificial Intelligence

All initiatives agree that the development of artificial intelligence (AI) should be carried out with an ethical approach, involving research, development, design, implementation, monitoring, and usage that considers various aspects. While there is agreement on the importance of ethics in AI development, each initiative has different priority areas. Analysis and categorization of these initiatives can be done based on the types of issues they aim to address, considering various approaches and solutions to protect against potential hazards. Some major issues arising from these initiatives can be grouped

into the following categories (Dewanto, 2023). First, human rights and welfare issues highlight whether AI genuinely prioritizes the interests and well-being of humans. Second, emotional harm includes the impact of AI on the integrity of human emotional experiences and the potential to facilitate emotional or mental damage. Third, accountability and responsibility address who is responsible for AI actions and how accountability is regulated. Fourth, security, privacy, accessibility, and transparency challenge finding a balance between accessibility and transparency while considering privacy and security, especially regarding data and personalization. Fifth, safety and trust question whether the public can trust AI and how to address situations where AI may pose a threat to its own or others' safety. Sixth, social harm and social justice emphasize the need to ensure that AI is inclusive, free from bias and discrimination, and aligns with public morals and ethics. Seventh, financial harm questions how to control AI to avoid negative impacts on economic opportunities and human job markets. Eighth, validity and justice underline the need for fair, equitable, and lawful management and use of data and AI. Ninth, ethical AI control and use contemplate how AI can be unethically used and how to ensure that AI remains under human control (Rahmawati et al., 2023). Tenth, environmental damage and sustainability demand protection from potential environmental impacts of AI development and use. Eleventh, informed use highlights the need for an informed and educated society regarding their use and interaction with AI.

Finally, existential risks address ways to avoid an AI arms race, mitigate potential dangers, and ensure that advanced machine learning is progressive and manageable. Overall, these initiatives share a common goal to identify and shape an ethical framework and system that prioritizes human benefits, mitigates risks and negative impacts, and ensures accountability and transparency in the development and use of AI.

Figure 1. General principles for designing, developing, and implementing autonomous and intelligent systems that are ethical and value-based (according to IEEE Ethically Aligned Design guidelines, First Edition March 2019).

The "Ethically Aligned Design: A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems" from IEEE, published in 2019, stands as one of the leading guidelines on ethical issues related to artificial intelligence (AI) development and various ways to address its negative impacts. The main areas influenced involve sustainable development, personal data rights and digital identity, accountability legal frameworks, and education and awareness policies. The values underlying this guide include universal human values, political self-determination, and technical dependence (Insani et al., 2023). n exploring potential harms, the primary focus is on human rights and well-being. All initiatives agree that AI should not violate human rights, involving human dignity, security, privacy, freedom of expression and information, personal data protection, equality, solidarity, and justice. Questions arise about how to ensure AI remains consistent with human rights and does not have disproportionately negative impacts on vulnerable community groups.

To protect human rights, IEEE recommends the establishment of frameworks, standards, and regulatory bodies overseeing AI usage. Translating existing legal obligations into informed policies and the use of cultural norms and legal frameworks is considered essential. Additionally, full human control over AI must be maintained without granting rights or privileges equivalent to humans. In the context of human well-being, defined as human satisfaction with life and living conditions, IEEE suggests prioritizing human well-being during the design phase (Marlin et al., 2023). The use of appropriate and widely accepted metrics in society is proposed to measure AI's success. The intersection between accountability and transparency is considered crucial to identifying human rights violations, providing redress, and implementing appropriate reforms. Protection of personal data is also a primary concern, with users retaining access and control over their data. This document reflects that AI development should be based on ethical principles, human values, and a deep understanding of its impact on human rights and well-being. By integrating these guidelines, it is expected that AI development can be progressive and aligned with human interests, ensuring that ethical values and human rights are protected.

Exploring Ethics in the Development of Artificial Intelligence: A Literature Review on Social and Moral Implications

Exploring Ethics in the Development of Artificial Intelligence (AI) is an in-depth analysis of the moral and social aspects related to AI technology's development. With the rapid advances in artificial intelligence, various essential ethical questions need to be understood and addressed. These critical questions include transparency and accountability in AI development, fairness in its use, security as an effort to protect humans and the environment, and how AI can be implemented without compromising individual freedoms. These aspects are at the forefront of investigating the social and moral impact that AI may have.

In the context of social implications, AI promises increased efficiency and productivity while posing risks such as potential job loss, increased social inequality, and shifts in societal values. While AI provides new opportunities, it needs to be cautioned that only a portion of society may be able to benefit from it, creating inequality (Safina et al., 2024). In terms of moral implications, decisions made by AI can have direct impacts on human lives. Moral principles such as transparency, accountability, fairness, security, and freedom serve as the primary guidelines in developing and implementing AI ethically. It is crucial to understand that AI decisions can influence human life in the contexts of employment, assistance, and punishment.

By emphasizing these moral and social principles, exploring ethics in AI development aims to ensure that technological advancements are made responsibly and align with human values. Awareness of the social and moral implications of AI serves as a foundation for achieving this goal, ensuring that the technology provides positive benefits without harming society and the moral values it upholds.

4. CONCLUSION

The exploration of ethics in the development of Artificial Intelligence (AI) represents an in-depth analysis of the social and moral impacts that can result from advancements in AI technology. With rapid progress in artificial intelligence, critical questions regarding transparency, accountability, fairness, security, and freedom become the primary focus of discussion. In terms of social implications, AI offers the potential for increased efficiency but also brings the risk of job displacement and growing social inequality. Moral implications encompass decisions that affect human life, with principles such as transparency, accountability, and justice serving as primary guidelines in the ethical development and implementation of AI. Awareness of these social and moral consequences becomes a crucial foundation to ensure that AI development provides positive benefits without harming human values and society.

The exploration of ethics also reflects concerns about the impact of 'mechanical Turk' in AI development, emphasizing ethical issues that arise in the development value chain. Focus on unfair compensation for workers and risks to mental health highlights the need for a more transparent and fair approach to workers in AI development. In the context of ethical exploration, this underscores the importance of ensuring that social and moral implications are well accommodated in the development and implementation of artificial intelligence. Overall, the exploration of ethics in the development of artificial intelligence provides a comprehensive view of the ethical challenges and considerations that must be addressed. Awareness of social and moral impacts serves as a necessary foundation to guide AI development with human values, ensuring that this technology contributes positively to society and aligns with evolving ethical principles.

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