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AI Research and Outlook of Social Science Perspective

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ABSTRACT

AI has permeated into many social fields with its fast development. Meanwhile, it has a deep impact on society, economy and culture. AI's applications improve industry efficiency and change the relationship among the labor market, social behavior mode, human being and technology. At the same time, ethical and social concerns such as data privacy, algorithm fairness come out of AI's development. This study is aimed to discuss AI's application in social science and the following challenges and opportunities. First of all, this study introduces basic concepts of AI and technical development. Secondly, this study discusses AI's impact on social structure and ethic of AI decision-making. Thirdly, this study discusses how to use AI to do distinct research in social science. Finally, this study puts forward ethical and legal concerns in AI development, and suggests facilitating AI rational development through interdisciplinary collaboration. This study simultaneously proposes recommendations for policymakers to implement effective AI policies in sectors such as education, employment, and social welfare, to make sure that the benefits of AI technology are fairly and fully shared. This study also indicates increasing AI research from the perspective of social sciences and technological sciences, blending theory, pursue and investigate closely about AI ethics, so as to offer regulation guidance and support theory.

KEYWORDS

Artificial Intelligence; Social Sciences; Social Structure; Ethical concerns

1. INTRODUCTION

Artificial intelligence (AI) was developed from solo technological innovation to social field revolution. Lots of industries, including healthcare, education, finance, and manufacturing, are changed by AI in human production and lifestyles. AI not only raises industrial efficiency, but also profoundly changes labor markets, and transforms social behavior patterns, and recognizes the relationship of technology and humanity (Ligo, Rand, Bassett, & Galaitsi, 2021). Accompanied by the development of AI, many concerns come out and attracted significant attention, such as data privacy, algorithmic fairness, employment structures shifts, unprecedented challenges and opportunities (Mahajan, 2023). Social science is one of the disciplines dedicated to studying human social behaviors, social structures, and social cultures. It is also faced demands and pressures from AI. Researchers need to explore and analyze society from new perspectives due to AI's influence on the labor market, education, social welfare system, etc. (Bainbridge, Brent, & Carley, 1994). Moving forward, the global academic community and policy makers need to think seriously about AI's potential threats to societal values, AI ethics, and technology regulation (Arees, 2023). This study's purpose is to probe into the application of artificial intelligence in the social science field with its' variation, and analyze how social science can comprehend and reply to these variations.

2. THE CONCEPT AND DEVELOPMENT HISTORY OF AI

The definition for AI is senior computer systems which can simulate, extend, or enhance human intelligence. The purpose of AI technology development is to design a system or machine to promote tasks performed capability, such as learning, reasoning, problem-solving, perception, and language understanding, which normally require human intelligence. Since Alan Turing proposed the concept of "thinking machine" in the 1950s, AI has gone through several stages of development. Early AI focused on logical reasoning and symbolic computation. Later, with the improvement of computer power, Modern AI is gradually shifting toward data-driven machine learning and deep learning methods (Raj, Soundarabai, & Augustine, 2023). Machine Learning is one of the core AI technologies. It refers to the process of enabling computers to automatically learn from data and make predictions or decisions through algorithms, which applications include recommendation systems, financial risk control, autonomous driving, and more (Khurana, Koli, Khatter, & Singh, 2023). Natural Language Processing makes computers to comprehend, interpret, and generate human language, which is applied in speech recognition, machine translation, and intelligent customer service (Chen, Xie, & Tao, 2022). Computer Vision is aimed at Enabling computers to 'see' and understand images or videos. AI's applications include facial recognition, medical image analysis, and autonomous driving (Wiriyathammabhum & Summers-Stay, 2016). With the growth of computer power and data volume, deep learning has become a key driving force in the development of AI. Furthermore, deep neural networks technology makes many breakthroughs in image recognition and speech recognition tasks (Khurana et al., 2023). These technology progresses help AI to be practical. For example, AI improves diagnostic accuracy for physicians through image identification technology; In the e-commerce field, AI improves shopping experiences through personalized recommendation systems; AI changes human lifestyles and work patterns through high level of autonomy in automatic pilot and intelligent robotics (Wah et al., 1993). In the future, AI is working together with other technologies such as the Internet of Things and 5G communication to develop intelligent cities and intelligent manufacturing (Wah, Huang, & Joshi, 1993).

3. AI'S IMPACT ON SOCIAL STRUCTURE

AI takes the place of traditional labor, especially in low-skilled and high repetitive jobs. Although this job substitution trend improves production efficiency, it changes the traditional employment structure and loses lots of positions in some industries (Gracea & Okoh, 2022). For example, automation and robotics make job elimination in manufacturing and logistics, on the other hand, many technical positions are added in financial, technology, and healthcare fields (Webb, 2019). Because of inequality in educational resources and technological access level, the income gap between different social strata may expand. Highly educated and skilled professionals can better leverage AI technologies, workers with lower skills face greater employment pressure and risk of reduced income. Society has a responsibility to adopt effective policies to reduce these inequalities and ensure that technological advances benefit all groups, rather than exacerbate divisions (Mao, Wang, & Yao, 2025; Gu & Wang, 2025). The development of AI technology is concentrated in a few developed countries and regions, while the slow popularization of science and technology in low-income countries and regions has led to a fall in their competitiveness in the global economy (Zhou, Wang, Cao, & Li, 2025).

4. AI AND SOCIAL ETHICS

Before exploring the relationship between AI and social ethics, a couple of questions need to be clarified. Can AI decisions be clearly explained? How transparency in AI Decision-Making affects fairness? Experts know that AI relies on big amounts of personal data for training and decision-making. If not properly protected, this data may involve personal privacy and could lead to leaks and

misuse of personal information (Zou, 2024). In addition, AI may exhibit algorithmic bias in decision-making processes, for example, AI systems may unintentionally exacerbate social inequality in the finance and recruitment industry due to biases in historical data (Katyal, 2019). When AI is involved in decision-making responsibilities in fields such as life, health, and social safety, and makes irreversible decisions (e.g., autonomous driving, medical diagnosis), who should take the responsibility? Developer, user, or AI? AI's autonomous decision-making may challenge existing liability frameworks in certain scenarios (Patil, 2024). Therefore, establishing a clear accountability mechanism to ensure that the responsibilities of technology developers, regulators, and all stakeholders are well-defined is key to the future development of AI. Previous studies point out that future research should focus on AI's transparency and interpretability in decision-making processes (Mogadala, Kalimuthu, & Klakow, 2021).

Global laws and regulations about AI currently are hysterical. Although some regions, such as the European Union, have enacted a law (GDPR) to strengthen the protection for data privacy, comprehensive supervision for AI is insufficient. AI algorithms regulation is too broad and lacks specific implementation rules, especially on transparency, data security, and social influence (Zharova, 2023). In consequence, it is necessary to adopt more strict and forward-looking laws and regulations globally to make sure that AI development is within acceptable social ethic and legal boundaries. As well as it is necessary to probe into AI ethics and regulatory localization to cope with special challenges from different countries and regions.

5. AI'S IMPACT ON CULTURE AND SOCIAL VALUES

The widespread use of AI not only can change the social economy, but also deeply influence acculturation in the context of globalization. Along with AI popularization in the global, value maybe arise conflicts in different cultures and backgrounds. The design and application of AI could be impacted by local cultural values, because of AI adaptation and applicability diversity. For example, in Western countries, AI designed mainly focus on individualism and efficiency. But, in some Asian countries, AI design focus on collectivism and social harmony. This difference may cause value conflict in cultures (Vega, Rivero, & Castro, 2024). Therefore, how to design and implement AI to avoid conflict is a big challenge.

AI rapid advancement may trigger a crisis in human identity and self-identity. As AI is applied in more and more fields, people may feel technology's impact on self-definition, particularly in traditionally human-dominated fields, such as work, creativity, and decision-making. For instance, people may query their uniqueness and role in society due to AI use in creative industries (Rajesh, 2024). Furthermore, individual privacy may be eroded, and that can make identity obscure in digital society. The crisis of human identity may have different influences under different cultural contexts, particularly when AI can imitate or even surpass human certain capabilities (Kim, Jang, & Kim, 2022).

AI has high potential in promoting social innovation and social welfare. AI technology can optimize resource allocation, improve decision-making efficiency, and provide personalized services to enhance public services quality and social welfare. (Calzada, 2024). For example, AI can help provide innovative solutions in fields, e.g. health, education and environmental protection, AI can help improve social governance level and increase public services' quality and accessibility. Furthermore, AI can increase citizen participation level in the digital age. By promoting information transparency and decision-making process democratization, AI enables more citizens to participate in social innovation (Padeppagol & Koti, 2025).

6. AI'S APPLICATION IN SOCIAL SCIENCE

In the sociology, economics, and psychology fields, AI is more and more popular. Particularly in big data analytics and social science research, AI helps scholars to do research with innovative perspectives and methodologies. AI dramatically improves the speed and accuracy of data handling, and makes social scientists able to analyze massive data to reveal social change trends and behavioral patterns. It was difficult to handle data through traditional methods before. For example, AI can identify latent social connections and conduct in-depth analysis of individual behaviors and social networks through data mining technology (Lorian, 2025). Moreover, in social surveys, public opinion analysis, and market research, AI can provide powerful assistance to it dig deep into social studies (Bokhari & Myeong, 2022).

AI is more and more popular in the social prediction and decision support field. AI can analyze vast historical data to forecast social trends, including population migration, urban development, and economic growth. AI helps provide data analysis support for policy-making. Governments and entrepreneurs can use AI decision-making to make precise and efficient decisions in a complex social governance background. For instance, city governors can use AI to optimize resource allocation and improve public service efficiency through real-time data analysis in intelligent city building (Gupta, Modgil, Bhattacharyya, & Bose, 2022). In addition, there has been increasingly more attention on AI in public policy and social governance, because AI gets the ability to provide strong evidence for scientific decisions (Gerdon, Bach, Kern, & Kreuter, 2022).

Traditional social science research usually depends on quantitative study or qualitative study. With the popularization of AI, researchers can utilize AI technology, such as machine learning and natural language processing to analyze big data, so as to reveal complex patterns hidden in the data (Robila & Robila, 2020). In the social behavior and policy making field, researchers can use AI to simulate social phenomena and predict social changes with better accuracy. It supports social science development and practice.

7. OUTLOOK AND FUTURE RESEARCH PERSPECTIVE OF AI

AI transforms progressively many facets of society, so interdisciplinary research between social sciences and technological sciences is more and more important. AI's development depends on computer science and data science support, and AI also requires the participation of disciplines such as sociology, economics, and psychology to get a better understanding of the social, economic and better evaluating on ethic impact (Kusters, Misevic, Berry, Cully, & Le Cunff, 2020). For example, AI's use in critical fields, such as healthcare, finance, and education, not only relies on technological advancements, but also needs rigorous ethical frameworks to guide its development. In the future, society must establish corresponding ethical guidelines to prevent the misuse of AI technology, and ensure AI's development aligning with social justice and public interests (Zafer, 2023).

From a technical standpoint, AI systems should address algorithmic bias and improve data security in the future. How to effectively regulate through policy, education and other means to avoid the social problems such as unfairness and unemployment caused by technology is also an urgent challenge to be addressed (Baum & Xie, 2021).

8. SUMMARY

This study reviews AI's influence in the field of social science, and discusses AI application diversity and significance. AI gradually transforms social structures, ethical issues, education and employment. AI can not only improve the efficiency of social science research, but also promote social innovation and improve social welfare. Nevertheless, AI also brings significant challenges, such as ethical

concerns, data privacy and algorithmic bias. These challenges need to be solved. Fortunately, these challenges can be solved through social science and technical science interdisciplinary collaboration to promote AI rational development and application.

This study gives some advice as following for policy makers to maximize social welfare through AI, and to guaranty AI's rational application. First, policy makers should develop specific policies to handle employment change by AI, and provide retraining and transition in the labor market, in particular for low-skilled workers. Secondly, policy makers should add AI related courses to cultivate interdisciplinary talents, particularly in sociology, psychology, and ethics applications. Finally, policy makers should complete AI regulations to protect data privacy, and to enhance algorithm transparency and explainability, and to encourage enterprises to practice corporate social responsibility (CSR) with AI applications to ensure the coordination of technology advancement and social value.

This study indicates future research directions of AI and social science integration. Firstly, leveraging AI technologies to enhance research methodologies in social sciences to strengthen interdisciplinary collaboration between social sciences and technological sciences, and to explore more effective research tools and approaches. Secondly, exploring the ethical applicability of AI in diverse cultural, social, and legal contexts, with particular attention to its impact on social inequality and cultural conflicts. Finally, exploring how to regulate policy to adapt to the rapid development of AI, and how to provide guidance for AI to develop soundly and avoid potential negative social effects.

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