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The impact of artificial intelligence on people's daily life

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Abstract: *This study uses empiricism and quantitative methods to analyze how AI impacts daily life, exploring potential threats, coexistence, and collaboration with humans, along with AI applications. An online survey with a "Likert scale" targeted individuals aged 18+, using QR codes and links. SPSS 20.0 analyzed the data, revealing AI's positive influence in work, education, and daily applications. While AI affects job displacement, its overall impact is minor outside of work. The study suggests promising adaptation, coexistence, and collaboration between AI and humans, pointing towards a positive future direction.*

Keywords: *AI applications, Ethics, Coexistence, Daily Life, Education, Work, Study, Technology, Substitution*

1. Introduction

1.1 Project Background

In the realm of modern technology, Artificial Intelligence (AI) has emerged as a pivotal force, reshaping various facets of society. From the automation of mundane tasks to the enhancement of complex decision-making processes, AI has seeped into the very fabric of our daily lives. As we stand on the brink of a new era, characterized by the convergence of human intellect and machine capabilities, it is imperative to delve into the profound ways AI is influencing our existence.

1.2 Research Motivation

The motivation for this research emanates from the recognition of AI as a transformative agent with the potential to significantly alter our work, learning, and personal lives. While the discourse on AI often focuses on its technological advancements and system-specific impacts, there is a conspicuous gap in understanding its broader implications on human life. This research aims to address this void by exploring the intricate relationship between AI and the everyday lives of individuals.

1.3 Problem Statement

The primary issues this research intends to address include:

- The extent to which AI applications across various domains affect different groups of people in their daily lives.
- The potential substitution threats AI poses to current and future human tasks and roles.
- The challenges and opportunities associated with the future coexistence and collaboration between AI and humans.
- The overarching trends in AI development and their projected impact on various aspects of human life.

1.4 Research Aims and Objectives

This study is designed with the following aims and objectives:

- To examine the hypothesis that AI has both positive and negative impacts on daily life.
- To analyze the potential threats AI poses to human coexistence and collaboration.

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- To identify areas where AI is likely to be integrated into everyday life.
- To broaden the understanding of AI development and application for the betterment of humanity.

2. Main Text

2.1 The extent to which AI applications across various domains affect different groups of people in their daily lives

In the medical field, machine learning methods are applied in various areas such as neurology, ophthalmology, oncology, etc., assisting doctors in predicting patients' health outcomes and facilitating research and evaluation of diagnostic methods [1]. IBM Watson technology aids in analyzing and managing medical data, MRI technology provides high-quality imaging data for patients, and Doctor AI offers fast and accurate medical advice and diagnoses for patients [22][28][42].

In the leisure and entertainment domain, collaborative filtering (CF) technology recommends personalized songs in music software based on individual preferences. AI techniques combined with the Minimax algorithm can provide near-perfect strategies for online board game players [30]. Additionally, there are AI movie recommendation systems integrating ABC (Artificial Bee Colony) and k-means algorithms [6][19].

In the business sector, Open Data Nation (ODN) collects data on the behavior of millions of individuals and businesses to predict issues and provide insurance underwriters with highly accurate risk scores through machine learning models [43]. RPA technology enhances the efficiency of shopping bots, while AI in CRM improves service efficiency and profitability for enterprises [15][33].

In the field of education, Intelligent Tutoring Systems (ITS) and Adaptive Hypermedia Systems (AHS) offer timely personalized classroom teaching for students, aiding them in mastering knowledge more effectively [18]. AI-assisted learning (AI-AL) technology provides personalized learning plans through advanced data analysis [5][14].

However, some pessimists argue that the application of AI in work and life may lead to a decrease in available human jobs and an increase in wealth inequality among different societal groups [27]. Concerns about "technological unemployment" arise with AI applications in the workplace, particularly in manufacturing where robot applications reduce employment, posing a threat to current American workers by as much as 47% [9][10].

In the realm of learning, such as adaptive learning, there may be limitations on students' perceptual choices and interests, especially when assistance is excessive [8]. Furthermore, AI technologies like IBM Watson may not guarantee alignment of learning objectives with students' individual learning styles, potentially leading to a decline in learning interests. Additionally, the application of AI in non-work settings, such as unsupervised contexts, may pose potential threats to society, for example through fraudulent activities like phishing using AI techniques to steal personal information.

2.2 The potential substitution threats AI poses to current and future human tasks and roles

AI exhibits capabilities surpassing humans in decision-making, particularly in achieving quantifiable objectives [32]. Jarrahi (2018) notes that human-AI collaborative decision-making significantly reduces error rates, for instance, decreasing errors by 85% in the diagnosis of lymph node cancer cells [17]. Research by Locsin and Ito (2018) indicates that humanoid robots are more accurate and efficient than humans in task execution, potentially leading to AI replacing low-skilled jobs [25][41]. However, AI lacks human self-awareness, understanding, and control abilities, as Lu, Li, Chen, Kim and Serikawa (2018) argue that AI can only operate effectively in specific domains, such as the application of deep neural networks (DNN) or recurrent neural networks (RNN) in speech recognition [23].

In the field of education, AI educational models enhance students' practical analysis and innovation skills with intelligent tools like machine learning [40]. 'robotic tutoring' can serve as a substitute for teachers, offering round-the-clock interdisciplinary course guidance [31]. However, the effectiveness of AI in enhancing students' soft skills is limited, and online education lacking face-to-face interaction may not improve learning efficiency for all students [24][26].

In non-work life, AI such as Google Duplex can perform simple interactive tasks, AlphaGo

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surpasses humans in the gaming realm, and Smart Travel Assistants (STTs) can create personalized travel plans based on individual data [16]. However, the application of STTs requires travelers' consent to safeguard their privacy and data security.

In the face of AI's substitution potential, McGovern (2018) asserts that embracing and learning to apply AI is the only way to avoid being replaced [29]. Frey and Osborne (2017) suggest enhancing human creative thinking and professional skills [10]. Decker, Fischer and Ott (2017) believe that by developing skills integrated with technological changes, humans can evade potential AI substitution [7]. Berg, Buffie, and Zanna (2018) propose that enhancing abstract reasoning abilities and expanding unique values can prevent AI substitution [4]. Atalay, Phongthiengtham, Sotelo and Tannenbaum (2018) argue that by elevating educational levels, humans can strengthen their abilities for non-traditional analytical tasks, slowing down AI substitution [2]. Kopytov, Roussanov and Taschereau-Dumouchel (2018) concur that reducing AI substitution can be achieved by acquiring higher skills [21]. P. Verma (2018) suggests that as long as humans develop capabilities at the same or faster pace, they won't be replaced by AI since human data can determine AI [38]. Kaplan and Haenlein (2019) propose that in order to adapt to the flexibility of future work and avoid the changes in job types brought about by AI, employees can develop new professional skills through lifelong learning [20]. Ma and Siau (2018) advocate for providing students with training and opportunities to acquire and develop soft skills in educational life [26]. Taddeo and Floridi (2018) highlight that in non-work life, the key to addressing new issues caused by AI is the rational control and use of AI's value [35].

2.3 The challenges and opportunities associated with the future coexistence and collaboration between AI and humans

In the future work scenarios, the application of Artificial Intelligence (AI) is gradually changing traditional work modes. For instance, AI robots like "Lowry" significantly enhance efficiency and quality in the clothing manufacturing industry through precise fabric tracking and sewing techniques [39]. Furthermore, the integration of AI algorithms simplifies workflows, boosts productivity, especially in the medical field, where AI rapidly processes and analyzes millions of images to assist doctors in better meeting patient needs [36]. However, as automation levels increase, the labor market may face challenges since automation could lead to reduced demand for human labor, triggering mass unemployment issues. Hence, creating new jobs and tasks that combine with AI technology becomes crucial [3].

In the field of education, AI is becoming a powerful auxiliary tool for language teaching, providing students with immersive learning experiences through the combination of AR technology and educational games [13]. AI robots not only enable synchronous online education in different environments to enhance the effectiveness of distance learning but also strengthen students' decision-making abilities in multicultural backgrounds through collaboration with educators [24]. Although the prospects for AI in education are extensive, direct involvement and guidance from teachers remain indispensable in courses requiring practical operations and interpersonal interactions [37].

In people's non-work lives, the application of AI also shows enormous potential. AI technology can create highly personalized interactive audio blogs by integrating rich content resources and enhance the accuracy of identifying the authenticity of masterpieces in the art field through the collection of extensive datasets [11]. Additionally, AI tools like "intelligent agents" will assist humans in completing specific creative cognitive tasks such as virtual painting construction [34]. However, as AI's application in non-work life deepens, we must also address the ethical and societal issues it raises, requiring us to apply intelligent technologies reasonably and seek proper solutions [12].

2.4 The overarching trends in AI development and their projected impact on various aspects of human life

AI development is moving towards AI 2.0 with internet-based collective intelligence. Industrial AI robots will expand in sectors like chemicals, transportation, and metal processing. Robot numbers will surge, reaching or surpassing 1:1 ratios globally. Advancements in neural networks, smart tech, and ethics are vital. Preventing system chaos from design errors is crucial, averting cost losses and productivity dips.

In education, AI will be widely used for multilingual learning, providing new digital behaviors through updated language resources, real-time tracking in and out of class, and various translation tools.

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AI's integration with emotion recognition and advanced speech will enable robot teachers, offering high-quality, cost-effective education. As computing costs drop and capacity grows, AI will advance rapidly. AI-driven MOOCs will expand, offering personalized education through student activity data. Yet, challenges remain in securing private student information in online databases.

In non-work life, AI like neural networks will enhance weather forecasts and optimize microgrid controls for energy efficiency. In VR gaming, AI will boost immersion, blurring lines between virtual and real worlds. Smart homes using AI can aid elderly care, but widespread adoption faces hurdles due to aging demographics and AI complexity.

After a thorough literature review, it's evident that AI more profoundly affects work life than learning and personal life. The benefits usually surpass drawbacks, with AI's substitution effects more noticeable at work. AI demonstrates heightened adaptability and future growth across daily life, indicating positive trends ahead.

2.5 Research method

This research uses quantitative methods to analyze AI's impact on individuals in work, education, and daily life. Grounded in empirical philosophy, an online questionnaire via "Wenjuanxing" gathered data objectively. It contained 35 questions on AI basics, applications, attitudes, and expectations.

During the experimental phase, the research team conducted a pilot study, gathering feedback from 15 participants with diverse backgrounds. This feedback facilitated meticulous refinement of the questionnaire, enhancing its acceptability and data quality. The final questionnaire was distributed through social media platforms like WeChat, reaching the target sample group successfully. Out of 420 questionnaires distributed, 395 were returned, resulting in 259 valid responses, achieving an effective response rate of 94% and an efficiency rate of around 66%.

In the data analysis phase, comprehensive statistical analysis was conducted using SPSS 20.0 software. Sample analysis revealed that participants predominantly fell within the 25-34 age range (49.8%), with a majority having attained a bachelor's degree or higher (45.9%) and working as office employees (69.5%)(See table 1).

Table 1: Basic data analysis of respondents

Characteristic variable		Respondents	
		number	Percentage (%)
Gender	Male	116	44.8
	Female	143	55.2
Age	18 to 24	79	30.5
	25 to 34	129	49.8
	35 to 44	40	15.4
	45 or older	11	4.2
Education level	Below High school	8	3.1
	High school	28	10.8
	Secondary school	34	13.1
	Junior college	70	27.0
	Bachelor or above	119	45.9
Occupation	Student	67	25.9
	Work staff	180	69.5
	Non-work staff	12	4.6

Reliability analysis indicated high internal consistency of the questionnaire, with all Cronbach's α coefficients exceeding 0.7, demonstrating good reliability.

Validity analysis, conducted through factor analysis, confirmed the structural validity of the questionnaire, with factor loadings exceeding 0.5 and cumulative variance explained surpassing 60%.

Correlation analysis unveiled significant relationships between AI applications and individuals' perceptions of its impact. For instance, positive correlations were found between AI application in work environments and positive impact perceptions (correlation coefficient 0.421), while negative correlations existed with negative impact perceptions (correlation coefficient -0.512)(see table 2).

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Table 2: Correlation analysis result table of AI application in work environments

		AI will have positive impacts on work life	*AI will have negative impacts on work life*
AI is widely used in work life areas	Correlation	0.421**	-0.512**
	Sig	0.000	0.000

The regression analysis further confirms the positive and negative impacts of artificial intelligence applications on the quality of work life, with an R-squared value ranging from 0.336 to 0.354, indicating that the model has a good explanatory power(see table 3).

Table 3: Regression analysis results table of the impacts of AI applied in work life

	OLS	OLS
	AI will have positive impacts on work life	*AI will have negative impacts on work life*
AI is widely used in work life areas	0.2310***	-0.1330**
	4.450	-2.42
AI is currently applied in daily work life	0.1251**	-0.0471*
	2.080	-1.9200
_cons	1.151***	-2.521***
	11.450	(-6.48)
R-squared	0.336	0.354
Adi-R-squared	0.321	0.324
F	243.21***	289.54***

The research findings suggest that AI applications yield both positive and negative effects in work, education, and non-work life domains. Specifically, in work environments, a significant positive correlation was observed between AI application and positive impact perceptions (correlation coefficient 0.421), while a similar correlation was found in non-work life domains (correlation coefficient 0.365). Furthermore, the emergence of AI substitution phenomena was positively correlated with attitudes towards avoiding AI substitution (correlation coefficient 0.251 to 0.362).

In conclusion, the study supports the following assertions, AI applications across various life domains have both positive and negative impacts on human daily life; the emergence of AI substitution phenomena promotes strategies to mitigate AI substitution; individuals' attitudes towards AI applications significantly influence the coexistence and development of AI with human life; and future trends in AI development hold potential positive and negative impacts on human daily life. These conclusions provide an empirical foundation for understanding AI's role in modern society, offer critical insights for the future development and application of AI technology, and underscore the importance of considering ethical and societal implications when advancing AI applications.

3. Conclusion

In the conclusion of this study, a comprehensive analysis was conducted incorporating the results of the questionnaire survey, sample characteristics, AI application domains, validity and reliability analysis, as well as correlation and regression analyses, leading to a series of clear findings. The research revealed that although the response rate of the questionnaire survey was high, the effective response rate was relatively low, possibly due to the length of the questionnaire and the time required for completion. Sample analysis indicated a slightly higher participation of female individuals compared to males, with the majority holding at least a bachelor's degree, and the sample mainly composed of working professionals. In the domain of AI applications, usage in work environments surpassed that in learning and non-work settings, possibly due to selection bias. Validity and reliability analyses indicated good quality of the questionnaire items and a reliable dataset.

Correlation and regression analyses unveiled significant relationships between the perceptions of the impact of AI applications in work, learning, and non-work settings, with regression analysis supporting the research hypothesis and confirming the positive impact of AI applications in enhancing quality of life. Although the application of AI in daily life has brought both positive and negative impacts, overall, the benefits outweigh the drawbacks. People's acceptance attitudes and adaptive developments towards AI play a crucial role in the coexistence and collaborative development of AI.

Based on these findings, future research directions and recommendations were proposed. Firstly,

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given the broad spectrum of AI application domains, future studies should delve into representative domains for in-depth exploration. Secondly, to obtain more accurate analyses of the impacts of AI applications, it is recommended to broaden the scope of survey participants. Furthermore, based on the feedback from this study, it is suggested that future research conducts large-scale pilot testing to optimize questionnaire design, making it more time-efficient, concise, and targeted. Moreover, the continuous advancement of AI technology necessitates future research to focus on how AI can adapt to and propel development across different domains, especially in environmental and developmental analyses. Considering the rapid progression of AI, it is advised that future research delves into the long-term effects of AI on specific domains or technological applications, as well as its potential to alter human lifestyles and work practices. Finally, with the ongoing proliferation of AI technology, future research should consider its ethical and societal impacts to ensure technological developments align with human values.

Through these conclusions and recommendations, this study provides an empirical basis for understanding the role of AI in modern society and offers a crucial reference framework for the development and application of future AI technologies.

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