Exploring the impact of ChatGPT on art creation and collaboration: Benefits, challenges and ethical implications

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ABSTRACT

This paper examines the chaos caused by introducing advanced language models, specifically ChatGPT, to art. Our focus is on the potential impact of ChatGPT on art creation and collaboration. We explore how it has been utilized to generate art and assist in creative writing and how it facilitates collaboration between artists. This exploration includes an investigation into the use of AI in creating art, music, and literature, emphasizing ChatGPT's role in generating poetry and prose and its ability to provide valuable suggestions for sentence structure and word choice in creative writing. We conduct case studies and interviews with diverse artists and AI experts to understand the benefits and challenges of using ChatGPT in the creative process. Our findings reveal that artists find ChatGPT helpful in generating new ideas, overcoming creative blocks, and improving the quality of their work. It enables remote collaboration between artists by providing a real-time communication and idea-sharing platform. However, ethical concerns relating to authorship ownership and authenticity have emerged. Artists fear using ChatGPT may lead to losing their artistic identity and ownership of their work. While our data suggests that ChatGPT holds the potential to transform the art world, careful consideration must be given to the ethical implications of AI in art. We recommend future research to focus on developing guidelines for the responsible use of AI in art, safeguarding artists' rights, and preserving artistic authenticity.

1. Introduction

The rapid progression in artificial intelligence (AI) technologies, particularly the advent of sophisticated language models like ChatGPT, has opened up new horizons in various sectors — notably, art. While AI shows great promise to augment human creativity and democratize access to creative tools, integrating intelligent systems also poses challenges for art's social dimensions and our conceptualization of creativity itself [1]. This innovative fusion of AI and artistry has unlocked fresh avenues for creativity, collaboration, and the very reconfiguration of art. ChatGPT's conversational abilities enable novel collaborations between humans and AI agents. This paper delves into the intriguing intersection of ChatGPT and the art world, exploring its transformative potential in co-creation, cultural identity, and commercial practices as AI becomes an active collaborator rather than a passive tool. Refer to 1, on the first developer conference [2], OpenAI announced an update to ChatGPT, which allowed the user to create their GPT without any coding knowledge [3].

We investigated ChatGPT's artistic collaborator and cultural mediator role by analysing works co-created with AI and research with art professionals. Findings illustrate ChatGPT's potential as an ideation partner, providing new inputs to catalyze creative thinking and aid fluid collaboration in real-time. For instance, ChatGPT could generate many storyboards quickly for the illustrator to decide the ongoing trend of their storytelling [4,5]. It could also provide diverse artistic styles for the art directors to determine which style refers to which artists. So they could find the most proper illustrator for their editorial illustration to save time for requesting the trial drafts [6]. However,
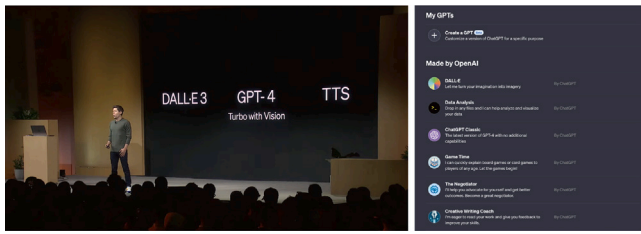
Fig. 1. On the OpenAI first DevDay, OpenAI introduced the newest beta version of ChatGPT.

Fig. 2. The poem generated the authors in Qinghua Jiuge.

questions emerged regarding attribution and IP rights when humans and AI jointly contribute to artistic works.

Meanwhile, these co-creations with ChatGPT also prompt reflections on what defines cultural identity and authentic self-expression in art. Some artists embrace AI as expanding their toolbox, while others fear loss of individual style. Artists have started to consider domains that artificial intelligence cannot achieve to develop new and more humanistic aspects [7], just as the invention of photography in 1839 promoted rather than hindered the development of art. They believe that artificial intelligence provides a scenario that humans have to face and have to deal with in the cultural upgrading of the human world, stimulating and urging humans to discover their values like the photographers turned to more creative photographic techniques and styles that were beyond mere documentation or the painters turned to express more spiritual than the reality [8].[2] Similarly, artists are exploring leveraging AI to expand artistic expression into more emotional, conceptual, and spiritual territories uniquely suited to human sensibilities and experience. This challenges artists to rediscover what makes them distinctly human at a time when machines encroach on various creative fields. Cultural institutions and commercial galleries likewise grapple with categorizing and promoting AI-infused art [9,10].[3]

On the commercial front, ChatGPT creates opportunities for virtual studios where geographically distant humans and AI co-produce customizable artwork. Some digital artists are experimenting with ChatGPT as a virtual studio assistant, rapidly generating sketch concepts or variations on production designs that the human artist then selects from and refines. This allows for producing more derivative works in less time to meet client demands [11]. However, monetary valuation disputes may arise regarding the AI's role. Different parties like artists, AI companies, and customers may each have views on the relative worth of human and AI labour in co-creations, setting the stage for potential financial disputes.

This study offers a holistic perspective on the potential impact of ChatGPT, highlighting both the benefits and challenges of incorporating this AI tool into the creative process. While our findings underscore the transformative potential of ChatGPT in artistry – aiding in idea generation, breaking creative blocks, and facilitating real-time collaboration – they also shed light on ethical concerns revolving around authorship ownership and authenticity. The question of preserving artistic identity and ownership in an era of AI-assisted creation has emerged as a pressing concern among artists.

1.1. Backgrounds

The increasing participation of artificial intelligence (AI) has ushered in a new era of creativity and collaboration, significantly transforming the field of art. As more and more users experience the joy of creating maps and generating poetry through AI (see Fig. 2), it is

evident that AI's impacts are far-reaching. Nevertheless, it is important to note that the inspiration these AI systems, such as ChatGPT, derive stems largely from extensive data sets, a resource obtained through unconventional channels that fuels their operation.

However, this development has sparked resistance from artists to the AIGC (AI-generated content) tools in art organizations and groups, which they believe are anti-human and anti-art. Their "resistance" has caused many chain reactions, inspiring a series of thinking about AI tools [12]. On the one hand, AI promotes the efficiency of art creation and output, inspiring artists' creative ideas effectively [13]. On the other hand, it has also been accused of appropriating the benefits rightfully belonging to others, thus casting AI as a thief that steals the bread off artists' tables. Like a sharp double-edged sword, these two effects have a positive and negative impact, which triggers our backtracing and reflection [14]. Do machines augment or replace? Expand or erode? Compliment or compete with human creative labour? The dichotomies generated by these pivotal questions have sparked seismic disagreements with no easy resolution in sight.

The influence of ChatGPT, the art management and artistic creation mechanism of the free artist system, efficient and normative, is a very useful for creative-related work. Simultaneously, it improves the efficiency of creation and also improves the creative comparison and creative competition between individuals [15]. Further, it raises ethical issues related to originality and morality. In exploring the impact of ChatGPT on art creation and collaboration, this study aims to delve into these merits, challenges, and ethical implications among co-creation, cultural identity, and commercial [16]. The objective is to comprehensively understand this paradigm shift and provide insights to guide AI's responsible use and evolution in art.

This raises a research question: How do we get the AI tool right and make it a generative aid in creating art without compromising the originality and initiative of the work? To answer this question, which is not only technically generic but also of serious concern to the art community, this paper explores the advantages and issues of incorporating AI in artistic creation through the case study of ChatGPT [17]. It is one of the most prevalent AI tools that most people are familiar with and have plenty of experience working with on both professional and leisure occasions [18]. This tool, with fairly open access and easy-to-work-with rules, has become a social phenomenon as a groundbreaking example of how the AI tool has entered contemporary life on such an unprecedented scale and become a flagship project to be recognized and studied from a scholarly perspective. With an emphasis on language and text, it also serves as a point of entry for rethinking the implications of other visually-based AI tools. The communicative power of ChatGPT that reflects the human faculty of language and symbolism, a crucial foundation for complex cognition and art creation, also helps us to unpack the co-creation aspect of AI art, one of the most common and important modes of using AI, which involves the interaction of multiple agents to generate meanings.

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[2] https://www.metmuseum.org/toah/hd/kodk/hd_kodk.htm
[3] https://shx.chinadaily.com.cn/a/202306/13/WS6487b8b8a310dbde06d230db.html

Table 1
Participants' and their information.

Participants	Age	Field	Gender
P1	45	Film Director	M
P2	38	Artist	M
P3	42	Play Writer	F
P4	29	Illustrator	F
P5	32	Comic Artist	M
P6	24	Media Artist	M

1.2. Motivation

The intersection of AI and art presents a transformative opportunity. AI, specifically advanced language models like ChatGPT, has the potential to redefine how art is created and how artists collaborate, offering unprecedented resources for inspiration and idea generation. ChatGPT is a unique case to focus on because it highlights the role of language and discourse in art. In *The Archaeology of Knowledge*, Foucault (2002) points out the role of discourse in society and that it is not merely language but power relations configured and expressed through language [19]. In this way, the creation and involvement of machine language also produce a new network of power relations that might affect humans and certainly artists. To update on this notion of language, Deleuze (2015) remarks that language is only understandable through sense, a quality lies between ideas and things, and an entity both attributed to and expressed by objects [20]. Art deals with sense in a way that inherits and renews it, and as sense is constructed through language, and so are power relations, we can see the connection between sense and power relations, which AI art, inescapably, still engages. Art can also be understood as language based on symbolism and interactivity. Going back to the Greek times, only language-based art forms such as epic, poetry, and drama were considered art. In contrast, sculpture was considered a craft, which was incorporated into the former as history unfolded. This historical connection between art and language inspires one to reevaluate the stake of introducing a machine language to an art creation process dominated by human language and discourse for millenniums. ChatGPT could also have challenged the concept of sense that attaches to embodiment, as Deleuze (2015) also points out that sense is challenged by nonsense. How can one differentiate sense and nonsense in the new scenario of artist–machine co-creation [20]?

In this vein, the emerging synergy poses significant challenges and ethical dilemmas that are yet to be fully explored and understood. There is an increasing need for a balanced perspective that appreciates AI's potential in the creative process while recognizing and addressing the ethical issues it engenders. We hope that through this study, we can contribute to a more nuanced understanding of how AI tools like ChatGPT can be responsibly integrated into the creative process. Additionally, we are motivated by the desire to inform artists, AI practitioners, and policymakers about the potential implications of AI in art, thereby facilitating informed decisions about its deployment and regulation (see Table 1).

The ChatGPT is a versatile tool for artists, providing a wide range of support from conceptual development to practical execution. We interviewed six artists from diverse fields: film, illustration, fine art practice, comics, and drama. Feedback from the interviews revealed that ChatGPT can inspire artists struggling with creative block. After completing a large art project, they often find themselves trapped in the project's context, taking a long time to disengage. This delays their inspiration and reflection for the next project. However, by inputting proposed themes, ChatGPT offers numerous art practice solutions through its descriptive statements. Based on the proposed concepts, limitations, and contributions, it can kickstart the creative process or help explore new artistic directions. For instance, when P1 finished a talking head-style documentary film, he could easily transition to an experimental film context by offering his actors' characters

and unconstrained keywords to ChatGPT for experimental storytelling, saving significant time. Additionally, ChatGPT can help creators avoid plagiarism with its vast database, alerting artists to what others have already done (P6).

Narrative development is essential in art forms such as painting, digital art, film, and performance. According to P2 and P4, ChatGPT can help artists construct narratives, develop character backstories, or even weave together thematic elements to create a cohesive story. However, sometimes, it does not achieve outstanding results like those seen in "Tenet", with its two paradoxical timelines, or "Everything Everywhere All at Once", known for its multitude of visual languages and expressions (P3). ChatGPT can provide technical guidance for traditional, virtual, or augmented reality art practices. As artists explore new mediums or techniques, they can gain a basic understanding of these methods (P5). Furthermore, ChatGPT can serve as an art critic assistant, offering constructive feedback and analysis before artists present their work to the public (P2). Artists can utilize ChatGPT to help write artist statements, grant applications, or exhibition proposals, especially since many lack proficiency in logical writing. It can assist emerging artists in articulating their artistic concepts and intents clearly and professionally (P6).

2. Large language model in co-creation

The Large language models have the potential to promote collaborative creativity when adequately supervised, overseen, and credited, with people explicitly defining the aims and results. According to the literature review, the ChatGPT can promote and inspire human creativity through idea development and discussion. Still, its capabilities are limited compared to human-level intelligence, emotional resonance, and life experiences. Its suggested applications should emphasize enhancing rather than replacing essential human activities such as original analysis, appraisal, and decision-making, which need complicated thinking, nuanced judgment, and embodied understanding. However, there are both potential and hazards to using ChatGPT's conversational abilities; it may improve some writing and learning activities when properly guided but also subtly impact human cognition and discourse if not well monitored.

Whether ChatGPT can be called an independent creative agent or artistic subject remains debatable, as it lacks self-awareness, intention, and the ability to build original meaning from a first-person perspective. Moving forward, constant philosophical reflection and diverse study are required to comprehend ChatGPT's implications, limit hazards, clarify its appropriate functions, and guarantee it enriches rather than dominates or degrades human values, conversation, and development. As technology evolves, advancing generative models like ChatGPT while growing human capacities for autonomous thought, compassion, and cultural flourishing will be critical in navigating difficulties surrounding human-AI interaction.

2.1. ChatGPT in co-creation

From the perspective of the philosophical issues involved in language, the main issue in ChatGPT is subjectivity, which is also the core philosophical topic. So, has the emergence of ChatGPT advanced the answer to philosophical questions? In his article "Has GPT Advanced Philosophical Issues?" [21], Zhao Tingyang focuses on explaining the core philosophical issues involved in CHatGPT. As far as ChatGPT itself is concerned, Zhao Tingyang believes that compared with the previous AI technology, its progressiveness is that it has entered the language field. The way of thinking it embodies has changed from mechanism to empiricism. Language is the essence of human existence, so the emergence of ChatGPT has hit the heart of human subjectivity. As for the essential issues of AI, such as consciousness, subjectivity, and intelligence, Zhao Tingyang believes that ChatGPT has not yet broken through the boundaries of the Turing machine. Judging from

Zhao Tingyang's analysis and attitude towards artificial intelligence, especially whether ChatGPT is creative, ChatGPT is ultimately still only mathematics and logic in nature and does not have true creativity; that is, it does not have its own "meta-language" and thinking ability supported by it. Therefore, although the art and literature works created by it are technically sophisticated, their artistic quality is mediocre.

In terms of the **subjective issues** involved in ChatGPT, Wang Bairong and Liu Haolong, as leaders in natural language processing technology, argue in their article "Rethinking the Subjective Status of Humans under Generative AI Algorithms - Taking ChatGPT as a Sample" [22] that ChatGPT algorithms not only represent an advanced data analysis tool, but also present a tendency towards power, profoundly affecting and controlling human cognitive patterns and behaviour, and even potentially dominating the operation of the state and society. Therefore, conducting multi-field, multi-level, and multi-dimensional inspection and reflection on the power of ChatGPT algorithms is necessary. From the perspective of subjectivity, in Heng L's article "Rethinking human excellence in the AI age: The relationship between intellectual humility and attitudes toward ChatGPT", [23] the author believes that intellectual humility, which recognizes the unreliability of one's beliefs, opinions, and knowledge, can increase participants' openness to experience, thereby promoting acceptance of ChatGPT. Regarding emotional issues closely related to the subject, the article "Can ChatGPT serve as an emotional expert? Investigating its potential in emotional and metaphorical analysis" explores ChatGPT's emotional analysis ability and its potential for understanding subjectivity and metaphor. The experimental results show that although ChatGPT achieves the best performance in dialogue generation, it still has the potential to improve emotional understanding.

From the perspective of the role in the language model of ChatGPT itself, Ke Pei, Lei Wenqiang, and Huang Minlie believe in the article "Research Progress of Large Language Models Represented by ChatGPT" [24] that recently large language models represented by ChatGPT have made the generation results more in line with human expectations through instructional fine-tuning and reinforcement learning based on human feedback, which can better solve natural language processing tasks in real scenarios. In the article "Production, Interaction, and Communication: Media Availability Analysis of Generative Artificial Intelligence - Taking ChatGPT as an Example", [21] Zhao Shuang explains that the content generated by ChatGPT can enter the scope of interpersonal communication and even mass communication from pure human–computer communication through the analysis of the "human-like" interactive function of artificial intelligence, which can realize the construction of social life. I think the statement of learning the construction of social life is too exaggerated, and it is too early to learn the construction of social life.

From the perspective of the role of ChatGPT in human cognition at the linguistic level, the article "ChatGPT: The cognitive effects on learning and memory" [25] comprehensively investigated these potential effects, emphasizing the need to utilize AI wisely, advocating an integrated approach that complements rather than replaces human cognitive functions, and encouraging further research on the long-term mental effects of interacting with advanced AI models such as ChatGPT. "ChatGPT: Transcending Language Limitations in Scientific Research Using Artificial Intelligence" [26] suggests using ChatGPT to supplement writing and reviewing tasks but should not rely on it to generate original content or conduct fundamental analysis, as it cannot replace human expertise, background knowledge, experience, and wisdom. "Beyond ChatGPT: A Conceptual Framework and Systematic Review of speech-recognition Chatbots for Language Learning" [27] proposes a conceptual framework consisting of three critical components of chatbot systems: goal orientation, embodiment, and multimodality. "ChatGPT's challenges and coping strategies for human language ability and language education" believes that to cope with the challenges of intelligent machines to human language ability, it is necessary to " [28] dig into the potential and enhance the ability" at the basic language ability level of human beings while cultivating and expanding new language abilities of human beings. "ChatGPT and the Generation of Digitally Born 'Knowledge': How Does a Generative AI-Language Model Interpret Cultural Heritage Values?" [29] The writing experiment of ChatGPT shows that the content generated is primarily descriptive, with limited coherence, no clear argument line, and unable to reach a high level of logic.

For the artistic creation issues involved in ChatGPT, it is necessary not only to comprehensively analyse its fundamental significance and value from the perspective of the digital art field to which it belongs but also to view the positive and negative impacts of ChatGPT dialectically. Based on this, we can specifically analyse the role of ChatGPT in literary and artistic creation.

From the perspective of the digital art issues involved in ChatGPT, "Sensibility, Virtue, and Law: A Study of the Three Philosophical Metaphysical Problems of Digital Art" [30] argues that the creation of digital art fundamentally changes the aesthetic order of traditional art construction. Compared to conventional literature and art, digital art can stimulate sensory and immersive emotions in aesthetic subjects. Still, its ability to stimulate edifying-free emotions is weaker, which leads to quantitative and qualitative changes in human-free emotions and also causes the transformation of artistic virtue from traditional spiritual edification and enlightenment-led to physiological sensory stimulation. The historical evolution of digital art virtue fundamentally resolves the inherent altruistic attributes of virtue, breaks through the long-standing bottom line of artistic ethics constructed by humans, and pushes the hidden issue of creative and legal issues under the traditional creative order to the forefront. This article proposes to build a low-carbon aesthetics and low-carbon art concept based on value theory, which effectively solves the inherent conflicts between sensibility, virtue, and law and rebuilds a harmonious order of contemporary art. However, in his article "The Trend of 'Dual-Axis Co-presence' Textual Hyperplasia in Contemporary Culture", [31] Zhao Yiheng believes that digital art cannot replace real artists because the aggregation process is almost completely obscured. Without aggregation, there is no authentic artistic charm.

The "Research on the Development Features and Trends of Digital Art in the Context of Media Convergence" [32] believes that the widespread application of digital technology in the cultural field has brought profound changes to the development of literature and art, forming a digital, networked, and intelligent trend with characteristics of the times. This change deconstructs the materiality, authenticity, boundary, and aesthetic style of literature and art while reconstructing the texture of artistic generation with new aesthetic relationships and algorithm aesthetics. In the context of digitalization, it changes the main functions, modes of existence, forms of communication, and consumption of literature and art. It constructs an increasingly large digital art market that meets the diverse needs of the public and a digital art industry with Chinese characteristics.

From the positive aspects of ChatGPT's artistic creation, in He Shuangbai's paper "Form Resonance: Exploring the Co-evolution of Human and Machine under the Surge of ChatGPT Intelligence", [33] the author analyses the aesthetic significance of ChatGPT-generated art from the perspective of "imagination stimulation". For ChatGPT-generated art, compared to general digital art, the author believes that the former has a certain degree of autonomy independent of the artist due to its human-like nature. As far as human thinking ability is concerned: "How do human intelligence, emotion, experience, imagination, and other aspects transform objective, logical processes into an aesthetic process? Artificial intelligence cannot imitate this organic, simulated complexity and subtlety mechanically". However, the author's attitude towards ChatGPT-generated art is positive. And believes that ChatGPT-generated art is an essential manifestation of post-humanist aesthetics and is not just a simple artistic creation tool but a "co-existence" subject that recognizes and transforms the world

with humans. I think the author's view is too optimistic and overestimates the artistic status of ChatGPT. ChatGPT's instrumental nature remains its main feature, and it does not have creative and aesthetic qualities.

Taking He Shuangbai's paper as the starting point, relevant views affirm the positive role of ChatGPT in artistic creation, focusing on the level of imagination. In the article "Complementarity and Symbiosis: An Analysis of the Human–ChatGPT Relationship from the Perspective of Imaginative Availability" [34] Lando and Chen Shuqi explore the role of imagination triggered by ChatGPT as a medium that elicits emotional needs.

From a negative and critical perspective on artistic creation, "Transience and Eternity: Reflections on the Relationship between Art and Technology" [35] responds to the relationship between art and technology from two different perspectives of transience and eternity in art, proposing that artists should adhere to the eternal and unchanging parts of art. Technology is nothing more than content that provokes thought or a means to be utilized, and it can never replace artists in thinking and creating. Art should express human emotions in imaginative forms, which is the eternal half of art, and it is what we should seriously consider and adhere to. The article "Post-human Body and Performance: Robots, Artificial Intelligence, Blockchain, and Others" [36] proposes the possibility of a new relationship between technological creations such as robots, artificial intelligence, and blockchain and the human "body" in a "post-human" state, which opens up new spaces for artists to create performance works. The world of "spirituality" that was once disenchanted by science may also return in the form of digital art.

This evaluation of traditional humanism is very unfair. The technological shift should optimize human rationality and emotional value rather than decomposition and deconstruction. The "post-human" state is not to make the value of human existence dissolve in a void space. Post-human artistic creation may only become the trial and error cost of human spiritual value rather than actual artistic creation. Art without a soul cannot be called art; it only brings about the disgust and discomfort of the technological spectre.

From the perspective of specific literary and artistic creation, Yan Feng believes that from the perspective of intellectual history, the "dusk of subjectivity" [37] is a crucial turning point in philosophical thought, representing the dusk of anthropocentrism, and ChatGPT further promotes this decentralization process. Regarding literary writing with ChatGPT, Yan Feng believes that ChatGPT embodies a logic of dialogue, which is more like the relationship between modern readers and authors. Moreover, there is a lot of false information in the output of ChatGPT. However, in literary creation, this issue has unique significance. In literature, errors are often the germination place of creation. Correcting and guiding errors generated in the text generation process of ChatGPT embodies dialogue and creativity. Chen Keyu, in the article "ChatGPT-4's Assistance Positioning in Chinese Writing", [38] recognizes the positive role of ChatGPT in assisting collaborators in writing and expanding creative space, but at the same time, points out that ChatGPT should ensure that legal and ethical norms are fully respected in the process of assisting writing.

However, in the article "From Legend to Daily Life, Reality Is the Starting Point of Literature", [39] Xu Yang criticized the writing of ChatGPT, arguing that ChatGPT could write novels but probably would write mediocre rather than unique novels. It may seem perfect, but it is not very unusual. In the article "Aristotle's Nightmare and Sartre's Anger - On the Impact of ChatGPT on Literary Creation", [40] Zhang Sheng believes that ChatGPT's literary creation ability is mainly reflected in its mastery and application of literary forms. Still, it cannot construct the content it represents. Moreover, ChatGPT's creation lacks the emotions of an actual author and subjectivity in its intervention into the real world, which will also affect readers' acceptance. At the same time, Zhang Sheng believes that ChatGPT's current demonstrated literary creation ability can positively affect literary creation's practice

and theoretical research and promote literary education. "A comparison of ChatGPT-generated articles with human-written articles" [41] compares the accuracy and quality of academic articles generated by ChatGPT and those written by human authors. From the data obtained from practical research and operation, it can be seen that the articles written by ChatGPT cannot guarantee authenticity.

So, can ChatGPT promote artistic creation? One view holds a positive attitude. The article "Can ChatGPT Boost Artistic Creation: The Need of Imaginative Intelligence for Parallel Art" [42] believes that ChatGPT is one of the leading large-scale language models, which has acquired language abilities such as text comprehension and logical reasoning, enabling it to engage in natural dialogue with humans. The next step for ChatGPT to break through is the imagination intelligence of artistic creation. The article "Can ChatGPT Create Real AI Art?" believes that emotion is not a necessary condition for a heuristic path, so ChatGPT can become a real creative AI, thus defending the valueism position of AI art [43] .

Another viewpoint holds a negative attitude. In the article "Can ChatGPT that can write poetry be regarded as the main body of artistic creation", [44] the authors Ma Lixin and Yang Dongni believe that ChatGPT currently does not have the qualifications to be the main body of artistic creation due to its lack of self-awareness and desire ability in its computational structure. To give ChatGPT these two functions, we face many ethical and legal risks and challenges. Therefore, only when humans sufficiently address and control these risks and challenges can we give ChatGPT the status of a subject.

Finally, the role of ChatGPT in art co-creation also lies in how we define art and co-creation. In ancient Greek societies, only language-based art was considered art. In the Renaissance, art was mixed with science and language, all as converging attempts to better the world and understand phenomena. Into modern times, art and science took divergent paths, whereas language became either literature or science. With the advent of Dada and Conceptualist movements. We live in a world where any linguistic formation, such as Marcel Duchamp's L.H.O.O.Q., has the potential to become art. Thus, the utterance, writing and presentation of language become the art-creation process. Meanwhile, art has not fully turned away from visuality, symbolism, and image. However, the image has far exceeded Heidegger's (1977) idea of the "World Picture" to become not only the primary medium through which one understands the world but also makes and reconstructs the same world (Heidegger, 1977, p. 115–154). ChatGPT was born into such a world. If we understand art as a concept-based process, and language is one of the significant conveyors of concept, then ChatGPT uses language but does not produce concepts. In this sense, making ChatGPT a new singularity to replace the speaking, writing, and performing artist (the old singularity) will be insufficient to make ChatGPT an art-creating subject. However, co-creation is different.

In the co-creation process, and in the case of ChatGPT, there are two modes of co-creation to be identified. The first mode of co-creation is the conceptualization of ChatGPT's production. In this first mode, human artists might not need to engage directly with the AI agent but simply take what AI produces or has produced as linguistic units and turn them into concepts, which would become art per se or its foundation. This process of conceptualization does not necessarily entail communication with ChatGPT. Still, the conceptualization of ChatGPT's outputs requires human subjectivity that treats AI as raw material to be utilized. The second co-creation mode is treating ChatGPT as a communicative partner in art. Although Western art history seems to emphasize the solitude of the artist to be equated to singularity, art has rarely been a one-man's job but a product of many hands, invisible or not. This collaborative process, in nature, necessitates communication and language as the basis for communication, which leads to conceptual, emotional, or technical actions. ChatGPT, accordingly, becomes the new hand of Rembrandt's apprentice to talk to his studio or the fresh eye of Gauguin to speak to Van Gough's left ear. In this

second mode of co-creation, an artist can draw from the communicative function of ChatGPT for technical responses.

Nevertheless, the emotional and conceptual responses are debatable from ChatGPT because the two aspects have to either rely upon the first mode of co-creation, the conceptualization and subjectivity of the artist him/herself, or the identity of ChatGPT to be treated as an equal par in terms of conceptual capacity and emotional flexibility, which takes more than the accumulation of data, but the answer to the question–if the accumulation produces an identity? Despite its movement and plurality, an identity is required in art-creation or co-creation. For instance, Rembrandt's studio may have a team of four apprentices working on multiple aspects of a painting. Even if their efforts might be indistinguishable from each other without a keen eye or documentation, they conceivably held different identities to mark their various strengths and interests so that Rembrandt could recognize them and assign them different works to make co-creation reasonable and productive. This example provokes one to think about the identity of ChatGPT in such terms: Does ChatGPT, as an artist partner for communication, show a singular or plural identity at certain moments? If its identity is plural, does it flash its plurality at one moment as one frame or develop it throughout different moments to build a duration of the event? Scholars like Barbara Pollack (2022) have described this plural identity as "Post-Internet" or "Post-Passport", meaning that the digital personae have made the liberation from identity possible and a playful process to be called art (Pollack, 2022). However, this process cannot be considered separate from human identity, even if it changes from one frame to another. The signifiers of this "Post-Internet" identity still draw from real-life displays of human identities. It is built by compiling a collection of these identities embodied as different moments. Although ChatGPT also draws from human language as its foundation, it is still debatable if this process of compilation creates a new identity coherent and stable enough to support artists in technical, emotional, and ideational terms. Retrospectively, it also asks the question if ChatGPT's language is indeed the result of drawing from human identities that speak the training units of its language, is it possible to rebuild these identities as material or build something new as a generative process, which is traditionally the unique work of an artist, or even an artist partner. The continuing examination of identity will determine how far, instead of residing on the binary of beneficial and detrimental, we can go with ChatGPT as a new agent of artistic co-creation.

So, starting from the identity issue of ChatGPT in the co-creation process, we can further consider the existing reasonable positioning problem of advanced language models of generative AI in artistic creation and collaboration. Whether it is ChatGPT or the video generation language model "Sora" that develops subsequently, from the perspective of intrinsic generation mechanism, the "language-image" generation mechanism embodied by both reflects the process of expanding the meaning of linguistic symbols. For the generation and expression mechanism of linguistic symbols and sensory expression, "visual" is the most intuitive way to show it. From the perspective of the generation and expression mechanism of ChatGPT and Sora, the symbol expression basis of both is "visual". Compared with the former, the latter gradually adds auditory perception form, expanding the primary "language-image" visual generation mode of human linguistic symbol expression to the visual-auditory generation mode. We must admit that ChatGPT, Sora, and even generative AI developed in the future produce a set of physical environments based on human sensory mechanisms. However, it is not easy to form a physical living environment equivalent to the natural one. Therefore, based on generative AI, creating a meaningful generation and expression mode that surpasses human beings and develops a generation mechanism independent of human creative ability from artistic creation is almost impossible. The main reason is that the underlying generation logic of ChatGPT and other generative AI participating in art is still a visual art image expression idea, which has not yet formed a creative framework

that breaks through the visual art concept. This also enables ChatGPT to play a role in group collaboration, pre-examining creative ideas, and equalizing artistic model control groups in the existing artistic creation process, especially in the collaborative creation process of artists.

In summary, ChatGPT is still an extension of human brains and senses in the co-creation process now, and it can still be an auxiliary tool for artists in the creative process. In the face of the future development prospects of human art, the participation of language models such as ChatGPT makes it difficult to truly understand people, human nature, the environment, and the relationship between people and the world. Still, it can provide a reflective "artificial" perspective and provide a practical way to deepen understanding of human subjectivity through human–computer interaction. This is the existing bottom-line function of ChatGPT in the co-creation process.

2.2. Chatgpt in culture identity

Following the previous section, it is not a stretch to ask: What produces an identity? For Foucault (1966), discourse makes power relations and power relations construct identities (1966, Foucault). Stuart Hall (2019) builds on Foucault's idea by claiming that "'identity' is a production of the struggling and reconciling process in which the subject fights with the discourse power" and that "it is also the self-imagination of the subject under the control of discourse power" [45]. These explanations all point to the agency to act (to fight) and the subjectivity to imagine. For ChatGPT, what is subject and object, as the epitome of the objectification of the subject, human? Although it is still ambiguous if ChatGPT has revealed any capacity to act upon or imagine the topic because most of its responses are fact-based and its arguments logic-based because they mostly show the build-up process towards argumentation without transcending this logic, ChatGPT has demonstrated the ability to follow, or at least, express specific orientations that were only found in humans.

In terms of the political orientation of ChatGPT, the article "ChatGPT's 'Understanding' and 'Meaning': On the Form, Function, and Position Behind Its Generated Language" [46] discusses the shortcomings of ChatGPT in understanding the meaning of natural language from the perspectives of linguistic formalism, functionalism, and critical discourse analysis. Firstly, ChatGPT's language mechanism relies on pre-training on English's superficial linguistic rules and statistical laws, focusing on cultivating the "formal language ability" of large language models rather than the same linguistic cognitive ability as humans. Secondly, ChatGPT is limited to information retrieval in the corpus and cannot distinguish and use context, thus being unable to realize the three meta-functions of language. In addition, the author found that ChatGPT, an artificial intelligence technology based on network big data, inevitably suffers from the influence of power and ideology behind the generated text, resulting in its tendency towards a specific political position. Therefore, users are required to improve their ideological discernment ability. David R.'s paper "The Political Biases of ChatGPT" [47] illustrates that ChatGPT's answers to political questions prefer left-leaning views. When explicitly asked about its political preferences, ChatGPT often claims to have no political views but only strives to provide factual and neutral information. Therefore, the author believes moral artificial intelligence systems should give the users balanced arguments on current issues, avoiding claiming neutrality while showing clear political bias in their content. In the article "Rational Judgment and Chinese Countermeasures on the ChatGPT Revolution: How to Analyze the Subversive Revolutionary Logic and Future Trends of ChatGPT", [48] Fang Xingdong and Zhong Xiangming focus on the AI technology transformation logic and the new path of industrial revolution behind ChatGPT and analyse the positive impact of ChatGPT on China's high-tech development strategy.

In addition, from the perspective of criticizing ChatGPT, the article "The False Promise of ChatGPT" [49] criticizes the currently popular machine learning programs such as ChatGPT, arguing that they cannot

achieve accurate artificial intelligence because they lack the critical abilities of human thinking and language, such as causal explanation, moral judgment, and creative criticism. The article argues that human thinking is an efficient and elegant system that can generate complex sentences and ideas using limited information and make speculations about non-facts and possibilities. The article warns that if we continue to indulge in the flawed artificial intelligence of machine learning, it will damage our science and ethics and calls on us to re-examine the goals and methods of artificial intelligence. The article "From Context Building to Context Re-separation: User Interaction with ChatGPT in Human–Computer Communication" [50] criticizes the drawbacks of ChatGPT's detachment from real-life situations from the perspective of context.

2.3. ChatGPT in commercial

ChatGPT can effectively and positively affect various business activities and areas. When banks introduce ChatGPT into their service systems, it means faster, more accurate and more efficient. Specifically, ChatGPT can replace manual labour for singular, repetitive, boring services that do not require specific needs, especially questions such as how to open and cancel an account. It also shows that visual design companies can better use this tool to enhance the service, packaging and promotion to customers. The scope of use is not limited to text writing work but extends to visual effects beautification, product modelling and creative images. They exceedingly improve the efficiency of service to customers because of more accurate design services. [51].

Although there are many benefits when using ChatGPT, we can acknowledge that there are also many disadvantages, and it can bring some difficulties and strikes in many fields, such as design (see Fig. 3), illustration (see Fig. 4), and advertising (see Fig. 5). This is because ChatGPT can make things easier faster and save time. Most importantly, AI is more precise to humans when meeting the market. Many art publishers use ChatGTP to organize literature and data, saving them a lot of work time in organizing art materials [52]. Stefano Filippi processes a series of experiments about how ChatGPT can impact innovative product design and thinks it can give some new ideas and innovations, such as themes, the design feels, colour, etc. When a designer uses ChatGPT as a design tool, they can be more convenient and quick, expanding the design boundary and increasing the overall number of designs [53]. ChatGPT also can change the areas of architecture and intern design. Based on NLP, the ChatGPT improves the communication between designers and customers. It is more beneficial and efficient. For example, when an architectural interior design company that takes sustainability and environmental protection as its design concept makes reasonable use of Chat GPT, it means that it can use Chat GPT to combine the environment to provide customers with effective solutions [54]. As the author, we believe that ChatGPT is involved in the design field in a multimodal way, which reduces the demand for human resources to a certain extent, reducing the market demand for labour, increasing unemployment and certain social anxiety.

3. Challenges and ethical implications in co-creative

While LLMs can potentially improve the collaborative creative process, they also create several problems that must be addressed. LLMs, like all AI systems, reflect the biases of their human data and, if not adequately governed, might perpetuate prejudices. Co-creation partners must prevent models from producing damaging, deceptive, or inaccurate information. Continuous monitoring is required to detect and mitigate growing biases over time. Partners must implement measures to assure informed consent, protect privacy, and prevent manipulation using unknown persuasive technologies. Overreliance on models can potentially reduce human partners' independence, talents, and decision-making capacities in the long run. Proper guidelines are required to preserve a sustainable human-AI balance of power in the

Fig. 3. The product design of a needle and a human head, generated by the authors in Midjourney.

Fig. 4. The illustration generated by the authors in Midjourney.

creative process. Addressing these challenges through multidisciplinary solutions such as technical safeguards, oversight processes, public engagement, and policy reform will be critical for maximizing the benefits of co-creative AI while mitigating harm. LLMs show promise for extending collaborative human creativity when managed prudently.

3.1. Challenges of ChatGPT's thinking

ChatGPT is far from translating all human thinking, significantly advanced thinking, into machine thinking. An important epistemological issue is that humans cannot fully understand human thinking as for thinking that humans cannot understand, "creative thinking" is the most prominent one because human creative thinking cannot be reduced to relevant theories of psychology, biology, and neurology. As for the so-called "creative thinking" of ChatGPT, its thinking is no

Fig. 5. The sunglasses advertisement generated by the authors in Midjourney.

longer closed but has contextual uncertainty, flexibility, or improvisation when establishing information or language connections. Therefore, ChatGPT forms a black box effect of incomplete transparency of thinking.

However, the 'autonomy' of ChatGPT's thinking is not equivalent to subjectivity, and GPT does not have its own beliefs and ideas. Fundamentally, ChatGPT needs to acquire self-awareness, reflexivity, and creativity to have the ability to create language independently. This is the limit of language. Linguist Noam Chomsky criticized ChatGPT for having no grammar but only data. The most fundamental problem of ChatGPT is that it has not developed its actual language. This symbol system can express anything but also has a reflective analysis, interpretation, and construction of its own "meta-language".

In the view of artistic creation, we can be sure that ChatGPT can play a positive role in promoting and facilitating artistic creation, not only by expanding the imagination space of artistic creation from the perspective of media and technology but also by facilitating the process of cultural expression and dissemination. However, it is worth noting that we should not exalt the role and value of ChatGPT in artistic creation, treating it as a universal means of expression that can describe everything. Therefore, we should oppose two extreme technological utopianisms and conservative resistance to technological innovation and comprehensively view the future development of ChatGPT from a cultural perspective, with the ultimate goal of improving human life. This is the essential attitude and principle we should adhere to in the face of ChatGPT.

3.2. Challenges of ChatGPT's cultural identity

To interrogate the limitations of ChatGPT in such complex activity as artistic co-creation, we cannot proceed without discussing culture identity, because art-creation not only requires an identity to join the process but also implicates the idea of culture.

Several definitions stand out. Foucault describes culture as "a hierarchical organization of values, accessible to everybody, but at the same time the occasion of a mechanism of selection and exclusion" [55]. Marx (1867) explains culture as "the mode of production of material life conditions the social, political and intellectual life process in general" [56]. To find culture, Adorno (1991) believes that it is a reflection of the human condition [57], while Lacan (2018) believes that it can only be identified with the symbolic order [58]. Hence, cultural identity can presumably be understood as a site of struggle and

negotiation in the human production system and hierarchy that reflects the human condition and resides in the symbolic order. However, one might wonder if this can be true for a hybrid entity like ChatGPT.

It is unarguably a product of human culture. Still, it is debatable whether it holds a cultural identity because, so far, it is a tool for the mode of production but not a site of struggle (although it can be used in this way by humans). It does not enforce or loosen any hierarchies or impose exclusion or inclusion. In this fashion, it is not easy to regard it as a site of negotiation. Nevertheless, it does embody a particular symbolic order because it communicates information through human knowledge and language. It also reflects the human condition just like culture–it is part of contemporary culture. Still, it is yet to make a stand for itself so it can move on its own in culture or even create a new subjectivity that confers itself some autonomy or sovereignty from culture.

Adorno (1991) also brings out the idea of the culture industry as one that reduces culture identity to passive consumers and users [57], and ChatGPT is already an essential player in the culture industry without having to reduce the artist to a user or elevating him/her to a subject that controls the culture industry like Hollywood or BBC. It does transmit the residue and products of the culture industry without judgment–is it free of judgment, or is ChatGPT an identity-less agent that enhances and reduces particular existent human identities?

In discussing the issues of cultural identity, one should not separate ChatGPT from human identities. On the one hand, it has not yet created a site of struggle or negotiation for challenging human identities beyond the paranoiac effects of an uncanny valley. On the other hand, it is inseparable from Marx's idea of culture as a mode of production, Foucault's notion of culture as a system of exclusion, and even Hall's concept of culture as a flight and imagination of the subject. If the machine cannot imagine, humans still imagine and fight in an existent culture.

Consequently, ChatGPT's cultural identity should be understood in terms of human cultural identity. Suppose particular human identities determine the symbolic order that still acts to construct and limit language, a primary medium for ChatGPT to be helpful. In that case, the paranoia should not go to whether ChatGPT has potentially created a human-like identity but to the existent identities that created ChatGPT and the ones behind the data flows from which it develops its pseudo-identity as a communicative agent. Suppose a particular response about a certain culture shows the preferences of certain humans as the traces or even the residues of a concurrent collection of human identities. In that case, the limit is not the amount of knowledge warranted by these identities but where this warrant is issued and how ChatGPT does not select a different collection of identities or even another group of conflicting identities that challenge the dominant ones. This is the site of selection but not the site of negotiation unless we can recognize and contemplate the human identities, such as the engineers, the websites, and the researchers that have decided to keep specific identities in the data pool without bothering to notice or evaluate them, not others. When it comes to ethical concerns, if we can classify ChatGPT's productions as part of discourse, it can help to form a narrative-based ethic. As Urbanski (2011) states, "Once this is accomplished, identity – whether fixed or discourse mediated – becomes in a sense a process of unfolding, a relational interaction between the good and bad of life, always in the process of becoming" [59], echoing Hall's (2019) idea of "diaspora identity" [45].

To resolve this limitation, scholars and artists should reconsider AI identity as one that is conditioned by cultural identities and continue to explore the ways that can provide a different approach to showing and channelling (also excluding and including) human identities through training, testing, and application mechanisms of AI tools such as ChatGPT, instead of indulging on a future where no human identities are discernible or necessary to be engaged to leave to chance (an algorithm is not chance!) that a philosopher king shall speak back to us outside our body, our culture, and our fears and limitations as humans.

3.3. Challenges in commercialization

ChatGPT's generation and output, while efficient at generating creative images, has many shortcomings regarding accurate images. This makes commercial companies and design companies need to use other design tools to assist in the secondary modification and processing of images in processing accurate images. For example, when using the topic-inspired words generated by ChatGPT for image creation and generation in the mid-journey platform, images often have illustrations and wrong expressions that do not conform to actual human characteristics when it comes to portraits [60]. The design departments of creative and commercial companies need to spend some time correcting errors by the ethics of human characteristics and partial modifications to the characteristics of external limbs. This design tool is not a perfect fit for ChatGPT yet, and this is one of ChatGPT's biggest challenges [52].

At the same time, to protect the privacy of artificial intelligence models and data, MLaaS (Machine Learning as a Service) providers only open API interfaces to provide services, and users who want to use model services do not have the opportunity to directly contact the big model code and data [61]. However, due to the main characteristics of AI models, if the data itself is not compromised, external commercial attackers may be able to steal and reproduce model functions and parameters through the model only based on specific outputs. The model output is easy to obtain, which determines that the privacy leakage related to the AI model is challenging to avoid and also causes a certain degree of privacy leakage and commercial security problems of art commercial companies [62]. How to solve these challenges and problems has become an essential issue for art business operators to consider.

4. Discussions

From the above sections, multiple perspectives on the development of ChatGPT at the current stage have been analysed. Though the possible benefits and the disadvantages of using ChapGPT have been discussed in the above chapters, the usage of LLM, like Chat, and Generative AI, like Midjourney, have been used in different disciplines and surprised people ever since its release [63]. The advantages and disadvantages of using ChatGPT during current workflow in various disciplines may have opposite conclusions. Still, the potential of using ChatGPT for higher efficiency and smoother workflow compared with the present process should not be ignored.

4.1. Efficiency and benefit

Integrating Generative Artificial Intelligence, such as Midjourney, within design and artistry is no longer covert, warranting a rigorous scholarly examination of its professional applications. The scholarly discourse articulated in "Can ChatGPT Boost Artistic Creation: The Necessity of Imaginative Intelligence for Parallel Art" delves into the capabilities of ChatGPT in augmenting the imaginative processes in artistic creation. It underscores ChatGPT's multifaceted potential, positioning it as a tool that transcends mere generations; it acts as an intellectual interlocutor, fostering novel artistic expressions and ideation strategies. Leveraging databases curated by human artists. Incorporating ChatGPT into this generative paradigm enriches descriptive inputs, enhancing the detail and complexity of subsequent visual outputs. ChatGPT's potential in generative AI artistry resides in its ability to embellish descriptions and provide intricate nuances drawn from extant texts for subsequent generation phases by its artistic knowledge learned from the web [42]. As a Language Large Model (LLM), ChatGPT offers many alternatives and perspectives informed by an expansive artistic database synthesized from the web. Moreover, ChatGPT functions as a communicative nexus between humanity and computational processes, eclipsing traditional human–computer interfaces with its innate capacity for human-like interaction.

ChatGPT has also been used for academic purposes. As an LLM, ChatGPT can quickly answer questions and help students save time searching for them by themselves [64]. ChatGPT proves its ability to work as a proof-read tool and put modifications based on existing texts written by humans [64], and this brings a higher efficiency compared with the traditional way of proof-read: asking a colleague or friend. In a college environment, proofreading is nearly a mandatory step for non-native speakers(NNS) in completing academic papers, and these international students will usually visit the universities' writing centre and seek help [65]. With the development of LLM and AI, students can use ChatGPT to save time in waiting and back-to-back visits, and the labour intensity of educators can be saved [66]. No doubt, the ability of ChatGPT replaced traditional proofreading for most students. However, proofreading by a natural person with corresponding knowledge of specific disciplines is necessary for scholars writing papers for academic journals to avoid possible plagiarism created by ChatGPT with false information [66].

4.2. Influence on ethical standards

The utilization of ChatGPT in the realms of generative art and pedagogy underscores its multifaceted utility; however, it manifests as a paradoxical entity akin to a double-edged sword: ethical quandaries accompany the increased efficient workflow engendered by ChatGPT. As delineated in Section 4.1, ChatGPT confers advantages to students in essay revision, yet its capabilities precipitate concerns regarding the engenderment of complacency among students [63]. As a Language Large Model (LLM), ChatGPT can assimilate and synthesize information from an extensive corpus of academic literature, thereby facilitating the composition of school essays that achieve high scores [63]. Still, such assistance might not align with pedagogical objectives. The advent of ChatGPT signifies a transformative phase in educational methodologies, but its pervasive application has sparked debates over ethical norms within academic ecosystems. The inherent risk of ChatGPT inducing plagiarism in essay production is a mere fraction of the potential issues; its proficiency in resolving homework and exam queries could further compromise the quality of education. While ChatGPT's text revision and language acquisition applications are showing positive effects [66], unregulated usage may threaten academic authenticity, potentially culminating in essays replete with inaccuracies [67]. Although it is ostensibly judicious to embrace advanced modalities for efficient knowledge acquisition, the incumbent implications for the calibre of educational outcomes are profound, potentially engendering a deficit in requisite skills upon student graduation. ChatGPT's capabilities extend significantly beyond essay assistance, encompassing code generation, simulated dialogues, interactive feedback, and creative authorship, including poetry and prose [63]. It is essential to acknowledge the capabilities of ChatGPT, which necessitate the institution of appropriate regulatory measures to ensure the integrity of educational standards. In the current regulatory vacuum, students may leverage ChatGPT to attain elevated academic performance with relative ease, which may reflect the prowess of the technology rather than the intellectual effort of the learners [63,67]. The imposition of regulations may serve to circumscribe the usage of ChatGPT; nevertheless, it necessitates the establishment of novel evaluative benchmarks to assess student performance accurately. This call for reform can be referred to a case at the 2022 Colorado State Fair, where Jason M. Allen's victory in the "digital art/digitally manipulated photography" category with Midjourney-generated works underscores the implications of utilizing Generative AI within unmodified traditional frameworks [68]. The inventive prowess of LLM and Generative AI requires the artistic database contributions of human creators. Although each artwork necessitates a considerable investment of time and creativity, AI can effortlessly yield multiple iterations from a single descriptive prompt [42], which raises concerns about copyright and showing unfair to human artists [68]. ChatGPT's role in streamlining artistic workflows does not bestow upon

Fig. 6. The portrait of pan generated by the authors in Midjourney, shows the ancient aesthetic preference for beautiful males in China.

it any form of creative autonomy, because its operations are initiated by explicit directives, with subsequent outcomes derived from that place. While ChatGPT enhances efficiency across various domains—a marked advancement over historical methods [42,63,64,69]—it also harbours the potential to engender a user dependency. The incident of AI-generated artwork garnering accolades is merely a precursor (see Fig. 6); in the absence of stringent regulatory oversight, AI's influence could permeate tangible aspects of our existence, even as it maintains its presence as a seemingly innocuous online chatbot.

4.3. AI and future challenges

In Sections 4.1 and 4.2, the benefits and threats to ethical standards raised by ChatGPT have been discussed, and by far, the development of ChatGPT and other LLMs seems to be under control. To maximize the capability of ChatGPT while keeping upgrading skills of our own becomes a topic of the threading on X (formerly Twitter) [63], and also, there are lessons been introduced on how to use LLM and generative AI to complete complicated jobs which require more labours in the past. Different from the example of in-school students, professionals with various backgrounds already have proper skills get the most benefit from using LLM and generative AI [67], and the usage of LLM and Generative AI will be expanded through time unavoidably. After the release of ChatGPT in 2022, the LLM and generative AI became a tool that anyone can use, which lowers the requirements to use AI compared with the past, and this gathered focus and investment for future development. For example, Microsoft announced that they would bring AI into developing gaming experience in partnership with Inworld AI [70] to help them build bigger-scale in-game dialogue and even create narratives, which used to be done by human writers. As mentioned in Section 4.3, the creativity of LLM or Generative AI relied

on corresponding databases built by human creators. Also, the results generated from AI require human evaluation. Therefore, while negative discussions around LLM, such as ChatGPT, have been happening since its release [63], the positive perspective of this situation is that humans have been pushed to a high-level job while creating more content with fewer times. Like the labour intensity of educators in universities of the proofreading case [65,66], with the application of AI in different professions, the overall efficiency and diversity of the results have been improved. Still, this improvement requires LLM and Generative AI to play a supportive role instead of the creator role. LLM and Generative AI are tools for humans; the critical factor is not how many abilities they have but the proper way to use them. The discussion about LLM and Generative AI replacing human labour can be compared with the conflict between traditional painting and photography when the camera first came out, which eventually pushed painting to the new age. In the case study on the project named Cangjie [71], the authors trained a neural network called Cangjie to continuously generate unique symbols based on Chinese strokes with a camera previously placed at the exhibition site to perceive information from the real world. Cangjie is an extraordinary case of how human artists could use AI to help create their original artwork with endless diversification, and it brings possibilities that no one could have ever imagined before AI came out. Although the optimistic prediction around AI seems fantasy and challenging, opportunities are still available, and achieving such a target requires effort and time. The challenges raised because of LLM and Generative AI are not on themselves but on higher requirements and possible skills demanded to be learned by human creators. The ability to evaluate works or texts generated by AI requires corresponding knowledge that at least the person can compete with AI; if human labour can no longer judge the strengths and weaknesses of the works or texts generated by AI, AI becomes the limitation of artworks. On the other hand, the new requirement for human creators after Generative AI and LLM become more intelligent than ever equals new opportunities and could attract different groups of the general public as fresh blood to expand the future passage. Also, artists have been seeking new forms of art creation for years, such as video art being created after video cameras reduced their price until the public could afford them. Thus, LLM, such as ChatGPT and Generative AI, could harm the industry, but there are advantages if people use them properly to push the industry further. In summary, the LLM and Generative AI are a double-edged sword: they threaten the industry while providing opportunities for creators to explore the future of the industry and rethink today's form of art creation.

5. Conclusions

In a time when artists regard ChatGPT as both the material for conceptualization and the partner for communication, in the co-creation process, ChatGPT and other AI tools have shown a multitude of benefits in fields such as academia, commerce, and beyond. Simultaneously, its limitations are technical (physical) and metaphysical, equally valuable for investigation. The technical issues of ChatGPT point to its ability to fully replace human productivity and subjectivity, while other challenges centre around its ambiguous identity, its relationship with human identity and condition, and the ethical issue of authorship and originality. In the future, the solutions to these problems will not be simple ones, nor will they remain technical. To consider AI tools such as ChatGPT as both an apt element of human culture and an agent independent enough to accompany and even assist human actions, we continue to behold the efforts of artists, scholars, and scientists, and most importantly, an expanding network interwoven between these new agents including the role of AI in driving and growing this network. This paper has explored the impact of ChatGPT on art creation and collaboration from multiple dimensions. Our analysis reveals ChatGPT's potential to aid artists in idea generation, overcoming creative blocks, and facilitating real-time collaboration.

Case studies demonstrate ChatGPT's utility as an artistic partner for brainstorming and the rapid creation of variations. However, concerns around attribution, authorship, and artistic authenticity pose ethical challenges that require careful consideration.

The limitations of the current analysis include a narrow focus solely on ChatGPT and textual art forms. Future studies could expand the investigation to a broader range of AI tools and artistic mediums. More empirical data through surveys and experiments would strengthen the evidence base. Longitudinal studies on the evolution of AI art over time would provide valuable insights.

Moving forward, guidelines regarding responsible AI use in art must be established to uphold artistic rights and identity. Hybrid human-AI approaches that focus on enhancement rather than replacement could allow the integration of AI capabilities while preserving the irreplaceable human elements that give art its depth. With prudent and ethical implementation, AI tools like ChatGPT have immense potential to expand the creative process. However, the essence of art as a profound human endeavour must not be compromised amidst the AI revolution. Balancing human imagination and wisdom with AI's data-driven capabilities is critical for the future of AI-infused art.

CRediT authorship contribution statement

Sijin Zhu: Writing – review & editing, Writing – original draft, Conceptualization. **Zheng Wang:** Writing – original draft, Conceptualization. **Yuan Zhuang:** Writing – original draft, Conceptualization. **Yuyang Jiang:** Writing – original draft. **Mengyao Guo:** Writing – review & editing, Writing – original draft. **Xiaolin Zhang:** Writing – original draft. **Ze Gao:** Writing – review & editing, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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