AIGC-Assisted Design: Ethics and Perception

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Abstract. This study aims to explore the ethical considerations and public perception surrounding the application of Artificial Intelligence Generated Content (AIGC) in design, while promoting the sustainable development and integration of technology with the humanities. An online questionnaire using the QuestionPro platform was administered to design professionals, focusing on key issues such as the originality of AIGC design, copyright protection, and factors influencing public acceptance. Data analysis was conducted using NVivo software. The results indicate that a majority of respondents believe that the originality of AI-generated outputs is manifested in various aspects. Furthermore, current copyright protections are deemed insufficient, and public acceptance is influenced by the quality of design. The study recommends that designers should harmonize their own creative inspiration with AI, establish a robust legal framework, enhance design quality, transparency, and environmental sustainability, and balance the relationship between technology and ethics to foster the healthy development of AIGC design.

Keywords: AIGC-Assisted Design; Public Perception; Copyright Protection, Ethical Standards; Creative Quality

1 Introduction

In the context of artificial intelligence generation technology-assisted design, ethical considerations and public awareness are two critical aspects. This involves original artificial intelligence generation technology (hereinafter referred to as AIGC)-assisted design, COP artificial intelligence generation technology, and other related forms of technical design expression. Design copyrights emerge from the intersection of artificial intelligence technology, public bias, and the inherent ethical considerations and public perceptions in art [1]. The purpose of this paper is to provide insight into ethical considerations regarding AIGC-assisted design and public perceptions of the acceptability of AIGC-assisted design.

1.1 Ethical Considerations

1.Originality issues of artificial intelligence-generated technology-assisted design.

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As AI, the bedrock of AIGC, is more deeply embedded in creative endeavors, the originality of AI - generated works has become a crucial concern [2]. he debate over whether AI - created outputs can be considered original, given their reliance on existing data and models, has sparked extensive discussions centered on ethics and public perception. [3]. American artist Kristina Kashtanova's science fiction comic book 'Zarya of the Dawn' was originally copyrighted because the U.S. Copyright Office did not know that some of the images were generated by Midjourney. After learning about the situation, the Copyright Office determined that the AI-generated images were not human creations and revoked the original certificate. The new certificate only included its text and the selection, coordination and arrangement of the AI works, excluding AI-generated images on the grounds that user input instructions cannot determine the final result. There is insufficient control over the results, so the images generated by AI are not original and are not protected by copyright. Furthermore, the inquiry into whether AI merely imitates the advanced cognitive processes of human creators or whether it fosters a new form of artistic expression raises additional ethical considerations that merit thorough examination within the realm of AI generation technology [4] [5].

2.The issue of design rights for technologies generated by artificial intelligence.

AIGC works of art involve complex ethical considerations and public perceptions regarding copyright [6]. Since these AIGC works are based on pre-existing ethical frameworks and public perceptions of AI-generated technical models or data sets, questions arise concerning the ownership of design rights for these works [7][8]. In January 2023, artists Anderson, Mckernan, Ortiz and others launched a class - action lawsuit against AI suppliers Stability, DeviantArt, and Midjourney. The plaintiffs accused Stability of unauthorized use of a vast number of copyrighted images to train its Stable Diffusion AI model. The court determined Stability was directly liable for copyright infringement. However, the plaintiffs couldn't prove Stability's indirect infringement and the direct and indirect infringement of DeviantArt and Midjourney. Currently, there is no definitive legal framework to address this issue, necessitating further examination and clarification [9] [10].

3.Bias and impartialit AI-generated technology-assisted design.

When training an AI model, the dataset used in AIGC design contains biases that can influence the content and style of the resulting AIGC works [11] [12]. For example, Tay, a chatbot launched by Microsoft, interacts and learns with users on Twitter. Due to the large amount of bad information and biased content on the Internet in its training data, Tay began to make inappropriate remarks such as racial discrimination and sexism soon after it went online, which seriously affected the public's acceptance of the AI and Microsoft' image. if the dataset lacks diversity or contains biased perceptions. Among tech apps, Apple's Siri sparked a privacy controversy, allegedly inadvertently activating it to send private conversations to companies and push targeted ads, which Apple initially denied before settling for a large sum. Amazon's pricing algorithms allegedly automate price manipulation, and regulators have begun building a regulatory framework for AI pricing models, despite claims of optimized efficiency.

In Asia, a Deepfake scam in Hong Kong, in which suspects posed as multinational executives and swindled nearly HK$200 million, was the first AI "multi-person face" scam. The Deep fake incident in South Korea is even worse, in the Telegram chat room,

users can upload female photos to obtain false erotic content, pay or invite friends to increase the amount, a serious violation of women's privacy, the perpetrators also committed sexual violence, threats and other behaviors, more than 220,000 people involved in a channel, including a large number of minors, these cases warn that AI technology is in urgent need of standardization and regulation. AI-generated art may reflect these biases, thereby affecting public acceptance and perception [13].

4.The Nature of Art.

The advent of AI has ignited debates regarding the essence of art. Can AIGC (AI-Generated Content) artwork be classified as genuine art [14]? Do these creations possess the ability to express the emotions, thoughts, and cultural nuances inherent in AIGC design? Alternatively, is AIGC merely a rudimentary auxiliary design tool and a by-product of AI technology [15]? "Theatre d' Opera Spatial" created using Midjourney by Jason Allen won first prize in the "Digital Art/Digital Manipulation Photography" category at the Colorado State Fair. Some people think that Allen's behavior is deceptive, while others support him and think that Midjourney is just a digital art tool. This has triggered extensive discussions about the definition of art, judging criteria, and the impact of technology on art. Some people even think that this is the death of art, while others think that AI creation should be recognized. These questions have influenced public perceptions of AI-generated art.

5.Replacing the role of human creators.

The rise of artificial intelligence and AI-generated content (AIGC) poses a threat to traditional art creators, particularly in the realm of commercial design works [16].AIGC can be produced using AI-generated technology, which meets market demand at a lower cost and with greater speed[17]. On October 22, 2024, over 10,500 creative industry figures from around the world signed a statement warning that the unauthorized use of their work by artificial intelligence companies poses a "significant and unjust threat" to the livelihoods of artists. Signatories to the statement cover a wide range of celebrities from literature, music, and film, such as Bjorn Ulvaeus, Julianne Moore, Thom Yorke, and Kazuo Ishiguro, as well as organizations and companies such as the American Federation of Musicians and Universal Music Group. The reason is that tech companies such as OpenAI often grab Internet data without consent to train algorithms, which the tech companies claim is "fair use" and content owners and publishers see as illegal copyright infringement。 This development raises concerns regarding the future place and role of human artists in the creative landscape.

1.2 Public Perception

1. Acceptance of AI Art.

Public acceptance of AIGC art is influenced by cultural backgrounds and individual ethical considerations, as well as societal perceptions of AIGC technology [18]. China's sci-fi short drama "Sanxingdui: Future Apocalypse" has been shortlisted in the relevant sections of several international film festivals. The drama, which takes Sanxingdui culture as its background and mixes ancient civilization with modern technology through AI technology, has attracted international attention. Audiences in different regions may

be influenced by cultural backgrounds and other factors, giving it mixed reviews and varying degrees of acceptance. In certain regions, AI art is embraced as a representation of AIGC technology; however, in other areas, there is apprehension regarding AI's involvement in the design industry. Critics argue that this intervention may compromise the uniqueness of human creations and the authenticity of AIGC technology works [18].

2. Education and Understanding.

Enhancing the public's understanding and education regarding the art of artificial intelligence is crucial, and the acceptance of AIGC technology continues to rise [19]. Through education, the public can gain a clearer understanding of AIGC artistic works and their role within cultural and social AIGC design. This understanding is instrumental in dispelling misunderstandings and prejudices surrounding artificial intelligence art [20]. In the 2022 Colorado Emerging Digital Artist Competition, AIGC painting "Space Opera" won the first prize and caused controversy. Critics, based on the traditional concept of art creation, believe that AI creation lacks human emotions, soul and real creative process, and cannot be compared with human art creation; supporters recognize AIGC creation because of the appreciation of the work and the creator investment in modifying the prompt words. The unique value of AIGC works reflects the public different perceptions of AIGC's artistic works under different artistic creation concepts.

3. Social Impact.

Artificial intelligence art is not only a product of AIGC but also reflects social and cultural changes [21]. Public perceptions of AI art and AIGC works significantly influence the developmental trajectory of the cultural and creative industries [22]. With the increasing accessibility of artificial intelligence tools, the trend toward democratization in artistic creation is becoming increasingly evident, enabling more individuals to engage in artistic endeavors [23]. Consequently, AIGC technology enriches the cultural ecology of contemporary design [24]. For example, Sharp Corporation developed the ChatGPT - based 'Story Dream Maker' App for the robot mobile phone RoBoHoN. Once users set story elements, RoBoHoN can create and read stories aloud with body language, enabling ordinary people to engage in story - making, embodying the trend of artistic creation democratization. Meanwhile, Stability AI's Stable Diffusion 3.0 has enhanced text - rendering, supports multi - theme and high - quality image generation, promotes 3D and video generation. In design, it helps designers generate diverse solutions, enriching creative sources and the design cultural ecology.

1.3 Our Project

With the widespread application of artificial intelligence in creative industries, existing intellectual property legislation remains incomplete, complicating the clear definition of copyright ownership and creator identity for works generated by artificial intelligence [25]. This process necessitates establishing the legal identity of AI and determining the appropriate protection for its outputs. Concurrently, ethical issues have become increasingly prominent [26]. Countries have emphasized the importance of technological transparency, fairness, and user privacy, introducing relevant regulations to ensure compliance [27]. In view of the wide application of AI in the creative industry and the

imperfections of the existing intellectual property legislation, this study aims to explore the degree of public acceptance of cultural and creative designs generated by AI and suggests that the public should promote their sustainable development in accordance with the ethical standards of each country, respecting the originality, preserving the copyrights and eliminating the bias, so as to ultimately realize the harmony between technology and ethics and to promote the advancement in the field of design.

2 Methodology

Our online QuestionPro survey consists of questions meticulously designed based on a comprehensive literature review, our previous project findings, and recent changes in government funding. The questionnaire is divided into two parts. The first part gathers basic information, including professional identity and the degree of understanding of AIGC. The second part addresses core questions, such as defining the originality of cultural creative design generated by AIGC, the current status of legal protection for copyright concerning such designs and potential strategies to strengthen it, key factors influencing public acceptance, methods to enhance public understanding and support, and how AIGC should balance technological progress with ethical standards while clarifying its developmental direction.

1.How to define the originality of AIGC design?

2. What is the current status of legal protection of copyright for AIGC design? How to strengthen?

3. What key factors influence the public's acceptance of AIGC design?

4. How to improve public understanding and support for AIGC design?

5. How to balance technological progress and ethical standards while clarifying the direction of development based on AIGC design?

6. The third part is an open question: Any other opinions or suggestions on AIGC design?

The survey responses, which included valuable insights relevant to this research topic, were uploaded to NVivo (2020 version) and thematically coded using the systematic phrase or sentence coding procedure outlined by Saldaña (2016). The coding process was executed in a sequential manner for each survey question. Conceptually similar text segments from each respondent were assigned unique thematic codes derived from the discourse data, allowing for the grouping of analogous responses under the same thematic code. In certain instances, a text might receive multiple thematic codes due to its complexity and richness.

To enhance the coding process, two associate professors from the design major, both of whom have extensive experience with artificial intelligence generation techniques, were invited to collaborate. Their expertise was invaluable in organizing the data into thematic codes and ensuring the accuracy of the coding. The primary responsibility for coding and documenting the analysis rested with the author, who maintained comprehensive records of all coded themes and subthemes associated with each survey question. Each coded topic was accompanied by references/responses, frequency counts, and a detailed summary outlining what was included or excluded under each thematic

code. This approach provided a clear framework for understanding the attributes of each identified theme.

The researcher was also supported in reviewing and ensuring the quality of the coded data. Weekly meetings facilitated the exchange, explanation, and review of topic codes and subcodes, fostering a dialogue that ensured specificity, observability, and validity in the coding process. During these sessions, new codes or subcodes were introduced as necessary, particularly if a parent code was deemed too broad or if more nuanced insights emerged. If certain topics were closely aligned, detailed expansions of some coding themes were pursued.

Decisions regarding what was included or excluded in either closed or expanded coding themes were interpretive choices made by the researcher, grounded in the evidence collected. Overall, three coding cycles were employed to capture overarching themes, culminating in a coherent narrative of the data. The analysis was conducted with a focus on themes, references/responses, and their respective frequency, providing a robust understanding of the survey responses.

3 Findings

Respondents generally held the view that the originality of artificial intelligence output is manifested in its originality, novelty, and uniqueness in comparison to the input data. The majority were dissatisfied with the current state of legal protection and deemed that copyright ownership was unclear. Technical transparency, creative quality, emotional value, and public trust are key elements. Education and publicity (such as exhibitions, lectures, and case sharing) are the main approaches to enhance understanding and support. It is recommended to establish ethics committees and industry standards to guarantee technical ethics. It is also necessary to strengthen cooperation, promote human-computer interaction, and pay attention to data privacy protection.

Among the 30 interview questionnaires, we included 15 (50%) associate professors of university design majors with over 2 years of AI application experience, 10 (70%) freelance designers with the same experience, and 5 colleagues with the same experience. Insights from experienced AI trainers were obtained. We curated responses to highlight commonalities, test assertions, and demonstrate topic-specific insights. Responses were selected primarily based on their support for the argument. All respondent statements referred to a unique three-digit identification number provided by questionPro.

Question 1: How to define the originality of AIGC?

When it comes to AI technology promoting design originality, several crucial factors are considered. A significant 60% of respondents stress that original designs should carry the designer's personal style for distinctiveness and recognizability. Everyone concurs that designers must blend their creativity with AI - provided material inspiration.

For instance, David Hockney used iPad painting software (with AI assistance) for “Pear Blossom Road” while maintaining his personal style. Refik Anadol, in creating “Machine Hallucinations - Space”, combined AI - analyzed universe - related image

data with his unique perception, endowing the AI - generated content with emotion and a unique perspective.

A staggering 83% of respondents believe the key to originality lies in the organic combination of AI inspiration and designers' creativity, along with their unique interpretations and meticulous adjustments. In industrial and apparel design, this is well - demonstrated. BMW used AI algorithms to analyze data for concept car design inspiration, and the designers optimized it. Gucci, in fashion collection preparation, let AI extract inspiration and then fused it with the brand's classic styles.

In creation, the core of originality is the deep integration of AI inspiration and designer's creativity. Designers need to reorganize, optimize, and recreate elements. The innovative use of cultural elements is also vital for adding cultural distinctiveness and value. Most respondents think original works should be novel in form and content, avoiding plagiarism. Personal labels can safeguard originality and intellectual property. Kris Kashtanova's case of applying for a copyright for an AI - created image shows the importance of proving one's creative manipulation.

Question 2: What is the current status of legal protection of copyright for AIGC? How to strengthen?

The legal protection status of copyright in AIGC design is currently unclear. Existing laws have not been able to keep pace with the rapid development of AI technology. As a result, there is a lack of clear and specific rules for defining copyright ownership and setting usage rules of AI - generated content. For instance, designers are often in a dilemma. They worry that when their AI - assisted works are used commercially or published, they may unknowingly be involved in infringement issues.

Moreover, there are significant differences in the legal regulations regarding AIGC copyright among different countries and regions worldwide. These disparities further complicate the already complex copyright issues in AIGC design on a global scale.

The vast majority of respondents believe that the top - priority is to establish a clear - cut legal framework. This framework should accurately regulate the copyright ownership of AI - generated content. It also needs to precisely define the rights and obligations of AI, designers, and other stakeholders. Some even advocate that laws should be updated in line with the development of AI technology to ensure their adaptability and effectiveness.

All respondents unanimously agree on the need to significantly strengthen the intensity of supervision and law enforcement. This can ensure the effective crackdown on various types of infringement behaviors and safeguard the legitimate rights of right holders.

About 46% of the respondents suggest intensifying copyright education and publicity to enhance public awareness. Countries should cooperate to formulate uniform standards to facilitate the circulation of AIGC works. Designers should also enhance their self - protection ability. For example, the European Court of Justice's ruling on utility art copyright in the EU and the European Parliament's AI Act on copyright disclosure are positive steps in this regard.

A specialized agency for AI design work copyright review and certification was proposed to promote the healthy development of this field. The 2023 - founded CRAAI in

the UK and US, with its multidisciplinary membership, promotes principles like a licensing marketplace and creator rights.

Public opinion holds that AI companies should pay royalties and disclose their data. The HarperCollins agreement with tech companies reflects the public's demand for the protection of creators' rights and interests. In the global creative environment, both in traditional and AIGC fields, copyright protection is crucial. In the AIGC field, China, the US, and the EU have taken measures such as introducing measures, issuing guidelines, and enacting bills to protect copyright.

Question 3: What key factors influence the public's acceptance of AIGC?

The public's acceptance of AI - assisted design is a complex topic that has been widely discussed among respondents. As high as 90% of them believe that the quality, aesthetics, and utility of design work are crucial determinants. For example, the ChatGPT - 3 tomato picking robot, Caltech's anti - infective catheter, and Aston Martin's automotive components all demonstrate that when these three elements are combined in AI - assisted design, public acceptance can be significantly enhanced.

The perception of AI technology also has a profound impact on the public's acceptance of AIGC design. In terms of technological advantages, cases like Coca - Cola's packaging design, Mark Newson's industrial product design, and Collov's interior design platform have increased public awareness of AIGC's advantages in improving design efficiency and reducing costs, thus enhancing acceptance. Regarding the design process and principles, Tsinghua University's YIBAIAIGC platform and McDonald's AIGC publicity advertisement, by demonstrating the full process and transparency, have enhanced public trust.

Designers emphasize the importance of public awareness of AI technology. BMW's use of AIGC in automotive appearance design and ZARA's application in apparel design, which shorten design cycles and meet market demands, have improved public acceptance. Platforms like Adobe Firefly and NVIDIA's AI painting open - source project, by providing clear guidance and disclosing operation mechanisms, have enhanced public understanding and trust.

There are both positive and negative factors influencing public acceptance. Positively, Tesla and H&M's use of AIGC in interior design and fashion collection creation, respectively, with an emphasis on environmental protection, have increased consumer acceptance. However, issues such as unclear data protection measures in some image - generating AI platforms and data leakage in AI interior design startups have triggered concerns about privacy and security, leading to a loss of potential users and hindering the promotion of AIGC design.

To effectively enhance AIGC's influence, several aspects need to be considered. First, publicity and promotion, like Midjourney's cooperation with social media and participation in design communities. Second, establishing user participation and feedback mechanisms, such as Autodesk inviting designers to test its AI - assisted design software. Third, building industry standards and regulatory systems, as the EU does in constructing an AI regulatory framework. Overall, these efforts can contribute to enhancing public acceptance, trust, and the global influence of AIGC design, making it more likely to be recognized and applied in a wider range of fields.

Question 4: How to improve public understanding and support for AIGC?

Synthesizing the coding theme, it is critical to increase public understanding and support for AIGC technology at a time when it is rapidly evolving. In terms of technology trends, AIGC model performance has been improved, application areas have been broadened, and tools will be easier to use in the future. For example, Apple integrates AIGC into product design, using AI to analyze data for inspiration, and designers control quality to create both innovative and high-performance products, highlighting the importance of design quality and innovation; Ikea uses AIGC to develop home design solutions, generating and optimizing solutions based on consumer preferences, which fits the public's aesthetics and strengthens public acceptance; Adobe promotes AIGC in creative software, and publicizes its efficiency improvement online and offline; and Adobe promotes AIGC in creative software, and publicizes its efficiency improvement online and offline. Adobe promotes AIGC in its creative software, online and offline to publicize its advantages of improving efficiency and reducing costs, so that more people can recognize the value of AIGC. In short, emphasizing design quality innovation and strengthening publicity and education are the keys to enhancing public understanding and support for AIGC.

Some interviewees emphasized that it is extremely important to enhance public awareness and trust in the field of AI design. Through the interactive experience and professional explanation of the AIGC art exhibition at the Venice Biennale, the public's understanding of the AIGC design process can be deepened; Google's AI Experience Day activity demonstrates the value of AIGC and builds trust by virtue of its transparent operation process and successful cases; NVIDIA demonstrates the application of AI in game development, emphasizing its auxiliary role and alleviating the public's concern about AI replacing human work.

To address the public's concerns about privacy and job displacement, providing training and educational resources enables the public to better understand and use AI design tools. Encouraging public participation in the design process and soliciting feedback can increase their sense of identity with AI design. In addition, interdisciplinary cooperation and the joint efforts of industry experts can pool ideas and promote the development of AI design.

Question 5: How to balance technological progress and ethical standards while clarifying the direction of development based on AIGC design?

After coding analysis, there are two key points in the field of AI-generated technology-assisted design. The first is to balance technology and ethics, such as NVIDIA and architectural firms to design landmark buildings, AI to provide a variety of options, because of an exaggerated program contrary to the principles of sustainability and so on and was abandoned, and chose a better program, reflecting the innovation to abide by the ethical bottom line; the second is to pay attention to the originality and copyright protection, Autodesk software relies on algorithms to detect infringement, provide copyright registration, and help artists to create works without copyright disputes, highlighting the importance of Autodesk Software

Personally, I feel that intellectual property protection is crucial in the field of AIGC. For example, StableDiffusion's unauthorized use of image data during training triggers copyright disputes, harms the interests of artists, reduces public trust in AIGC, and hinders the development of the industry. Adobe strictly examines the source of training

data in AIGC software, establishes a copyright management system, and cooperates with copyright organizations to monitor copyright infringement, protects the rights and interests of creators, enhances public trust, and promotes the application of AIGC technology.

At a time when AIGC design is rapidly developing, environmental protection and sustainability, data and privacy protection, and interdisciplinary cooperation are key to its robust development. Some interviewees mentioned that Foster and Arup cooperated to build a green commercial complex, practicing the concept of environmental protection through AIGC technology and green materials; Figma encrypts data and manages permissions in the application of AIGC to protect data privacy and security; and MIT Media Lab's AIGC innovation program gathers experts from multiple fields to realize interdisciplinary cooperation and promote the innovative application of AIGC technology. For the long-term development of AIGC design, it is necessary to make concerted efforts in these areas and take into account the needs of all parties.

In the field of AIGC design, the practices of Google, Adobe and Canva are very useful. When Google developed AI image generation tools, it set up a legal compliance team, conducted a comprehensive self-examination of the R&D process, strictly examined the content of images, and flexibly adjusted the algorithms in accordance with the regulations, which successfully won the trust of users and fully embodied the key role of compliance with the regulations, while Adobe initiated the development program for AI design talents, offered professional courses, and encouraged the designers to participate in the practice, thus building up a technically competent team.Canva By analyzing user data and researching the market, Canva added exclusive templates for social media platforms to its AIGC function, significantly improving user satisfaction. Many interviewees believe that these initiatives are worthy of learning from the industry and can effectively promote the development of the AIGC design field.

Individual respondents believe that AIGC design requires designers to maintain creativity, incorporate ethical responsibility and humanistic concern, and realize sustainable development. For example, when famous industrial designer Yves Behar designed smart speakers, he used AIGC technology but did not rely on it, incorporating his own creativity to make the products both functional and aesthetically pleasing; Interface utilized AIGC to design carpets, screened environmentally friendly materials, and avoided hazardous ingredients to fulfill its social responsibility; and Apple utilized AIGC technology in the design of its cell phones, taking into account both technical specifications and user experience to optimize the appearance and interaction design. Optimize the appearance and interaction design.

Question 6: Any other opinions or suggestions on AIGC?

Under the wave of globalization, the design field is facing profound changes, and it is recommended to build a perfect design system, in which talent training, technology integration and human-machine collaboration are crucial. Germany's GK Design Group attaches importance to talent cultivation and enables designers to master AIGC technology, and in cooperation with Chinese enterprises, it enhances the humanization and flexibility of design and realizes efficient use of resources. Sougwen Chung, a Chinese-Canadian artist, created “Genesis”, which utilizes virtual reality and other technologies to realize human-machine collaboration, highlighting the core position of human creativity. The experience center created by Tidus and Gensler integrates various elements

through human-computer collaboration to enhance the characteristics of design innovation. These cases show that the interviewees' strategy of emphasizing talent training and promoting human-computer collaboration is the key to improving the level of design and innovation, and is also the way forward for the future development of the design field.

For example, in some large-scale design projects, designers can use AI to quickly generate some preliminary design drafts, and then rely on their own unique creativity and aesthetics to optimize and improve the drafts. For example, when BMW designed the iNext concept car, AI integrated market data and professional knowledge to generate the first draft, and designers incorporated brand features and optimized the interior to make the car both technological and sporty. Chanel also used AI to analyze fashion data to generate sketches for its clothes, and the designers retained the bold color scheme, used tweed and hand-embroidery to sculpt the details, and adjusted the shape, which made the works shine at Fashion Week.

In the design field, AI is revolutionizing traditional models, with 50% of respondents emphasizing the importance of balancing AI with the role of the designer. For example, Autodesk cooperates with Zaha Hadid Architects, the former provides AI tools, the latter gives full play to creativity, realizes complementary advantages, and also adopts environmentally friendly materials to reduce energy consumption. Nike optimizes the mechanics of shoes with AI, and designers control the appearance and selection of materials, and use environmentally friendly materials to balance design and environmental protection. IDEO analyzes the office scenarios with AI, and designers are in charge of furniture design and choose environmentally friendly panels. Nike uses AI to optimize the mechanics of shoes, and designers control the appearance and material selection, using environmentally friendly materials to balance design and environmental protection. These cases together prove that it is extremely critical to explore the balance between AI and designers, not only to utilize AI to process data efficiently, but also to give full play to the creativity of designers and incorporate environmental protection concepts, so as to promote efficient, environmentally friendly and sustainable development in the field of design.

Some interviewees also emphasized that it is crucial to meet the needs of users in the design field and adapt to market changes, while AI technology brings new opportunities and challenges. For example, Tesla pays attention to users' demand for electric car performance and adjusts its design strategy through various ways to grasp the trend and maintain its competitiveness. when Adobe develops design tools, it deeply understands users' needs, applies AI, invites users to participate, and discloses the principles to enhance users' acceptance. When Adobe develops design tools, it deeply understands user needs, applies AI and invites users to participate, disclosing the principles and enhancing user acceptance. It can be seen that paying attention to user needs and market trends, guiding user participation, and increasing AI transparency are important ways for the development of design innovation.

Some interviewees believe that actively exploring new methods and concepts is the key to promoting progress and innovation in the industry. For example, Apple breaks the traditional button layout in iPhone design, introduces multi-touch technology, and practices the interaction concept of simplicity and ease of use. At the same time, it

optimizes Siri through deep learning, so that it can proactively push information according to users' habits, and understand and respond to commands in a more humane way, thus improving design efficiency and user experience. BMW explores new spatial layout and human-machine interaction concepts in car interior design, and upgrades its intelligent driver assistance system to provide humanized suggestions based on driving scenarios and habits.

4 Conclusion

This research focuses on the application of artificial intelligence generation technology (AIGC) in the design field, conducting a thorough analysis of complex ethical and cognitive issues while striving to promote sustainable development and foster a deep integration of technology and the humanities. The study encompasses a broad range of design disciplines and comprehensively examines the application of AIGC across multiple dimensions, including technology, law, and society. To illustrate this, an analytical model diagram depicting the relationship between ethics and technology has been constructed (as shown in Figure 1), which clearly presents the key elements and their interconnections.

Regarding technological development, AIGC is continually evolving, with an expanding range of applications and an increasing emphasis on data processing, thereby establishing a robust foundation for its advancement within the design sector. In terms of ethical principles, challenges such as data integrity, copyright ownership, and originality are becoming increasingly apparent. For instance, defining the originality of AIGC-generated works poses difficulties, while legal discrepancies between countries result in copyright confusion and data inconsistencies. These issues necessitate in-depth study and appropriate resolution. Furthermore, in the context of the social and cultural environment, the laws, regulations, and societal norms of various countries significantly influence the development of AIGC. Legal differences impose limitations on copyright management, while cultural perceptions affect public acceptance of AIGC. Technological development causes ethical issues, ethical constraints guide technological development, ethical principles regulate technological applications, technological development affects the definition of ethical principles, social and cultural environment affects the relationship between ethics and technology, and the relationship between ethics and technology reflects the social and cultural environment. However, the model still needs to be quantitatively verified, which will be the next research.

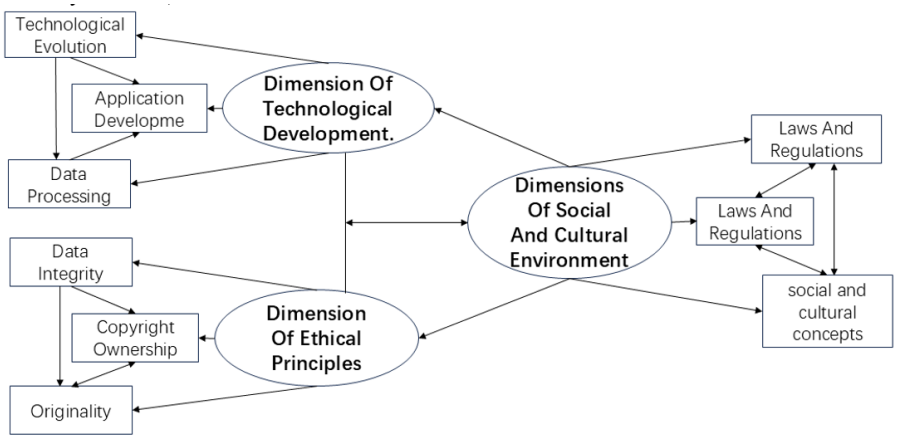

Fig. 1. Relationship Between Ethics and Technology

The study concludes that designers should integrate their own characteristics with AI inspirations to ensure originality. They must establish a robust legal framework and regulatory system to enhance copyright protection. To improve public acceptance, designers need to focus on enhancing design quality, ensuring technical transparency, and practicing environmental protection. Furthermore, it is essential to strike a balance between technology and ethics throughout the entire design process, while also paying attention to the protection of and collaboration among various aspects. This approach outlines a clear direction for the future development of AIGC design and will facilitate its steady advancement within the design field.

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References

1. Schicktanz, S., Welsch, J., Schweda, M., Hein, A., Rieger, J. W., & Kirste, T. (2023). AIGC ethics? Considerations of AI simulation for the ethical assessment and design of assistive technologies. Frontiers in Genetics, 14, 1039839.
2. Samsonov, A. (2024). Media Portrayal of AI-Generated Art as Possessing or Lacking Cultural Capital (Master's thesis, Colorado State University).
3. Senftleben, M., & Buijtelaar, L. (2020). Robot creativity: an incentive-based neighboring rights approach. Available at SSRN 3707741.

4. Bonadio, E., & Lucchi, N. (2019). How far can copyright be stretched? Framing the debate on whether new and different forms of creativity can be protected. Intellectual Property Quarterly (2019).
5. Aicardi, C., Bitsch, L., Datta Burton, S., Evers, K., Farisco, M., Mahfoud, T., ... & Ulnicane, I. (2021). Opinion on trust and transparency in artificial intelligence—ethics & society. Hum. Brain Project.
6. Gaffar, H., & Al-Barashdi, S. (2024). Copyright Protection for AI-Generated Works: Exploring Originality and Ownership in a Digital Landscape. Asian Journal of International Law.
7. Guan, A. (2023). Research on Copyright Protection of Works Generated by ChatGPT. Journal of Innovation and Development, 4(1), 92-94.
8. Celik, E. (2020). How Ip Struggles to Define AI-Generated Products and the Ownership Dilemma. Available at SSRN 3763885.
9. Gordon, S., Mahari, R., Mishra, M., & Epstein, Z. (2022). Co-creation and ownership for AI radio. arxiv preprint arxiv:2206.00485.
10. Watiktinnakorn, C., Seesai, J., & Kerdvibulvech, C. (2023). Blurring the lines: how AI is redefining artistic ownership and copyright. Discover Artificial Intelligence, 3(1), 37.
11. Badyal, N., Jacoby, D., & Coady, Y. (2023, October). Intentional Biases in LLM Responses. In 2023 IEEE 14th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON) (pp. 0502-0506). IEEE.
12. Srinivasan, R., & Uchino, K. (2021). Quantifying Confounding Bias in Generative Art: A Case Study. arXiv preprint arXiv:2102.11957.
13. Van Assen, M., Beecy, A., Gershon, G., Newsome, J., Trivedi, H., & Gichoya, J. (2024). Implications of bias in artificial intelligence: considerations for cardiovascular imaging. Current Atherosclerosis Reports, 26(4), 91-102.
14. Lee, Y. K., Park, Y. H., & Hahn, S. A Portrait of Emotion: Empowering Self-Expression through AI-Generated Art. arXiv 2023. arXiv preprint arXiv:2304.13324.
15. Nalaskowski, F. (2023). Scientific Papers Generated by Artificial Intelligence. Fraud or Opportunity. Studies on the Theory of Education, 14(1 (42)), 165-180.
16. Nazar Manu Madhav, F. (2023). The Rise of the Machines: How AI is Disrupting Traditional Artistic Practices. International Journal of Science and Research (IJSR).
17. Selvadurai, N., & Matulionyte, R. (2020). Reconsidering creativity: copyright protection for works generated using artificial intelligence. Journal of Intellectual Property Law & Practice, 15, 536-543.
18. Jang, Y. (2023). Anthropomorphism, perceived learning for creation, and growth creative mindset as predictors of acceptance toward artificial intelligence creativity. Social Behavior and Personality: an international journal.
19. Kelly, S., Kaye, S., & Oviedo-Trespalacios, O. (2022). What factors contribute to the acceptance of artificial intelligence? A systematic review. Telematics Informatics, 77, 101925.
20. Haase, J., Djurica, D., & Mendling, J. (2023). The Art of Inspiring Creativity: Exploring the Unique Impact of AI-generated Images. Americas Conference on Information Systems.
21. Then, C., Soewandi, E.J., Danial, M.F., Achmad, S., & Sutoyo, R. (2023). The Impact of Artificial Intelligence on Art - A Systematic Literature Review. 2023 IEEE 9th Information Technology International Seminar (ITIS), 1-7.
22. Ali, S., & Breazeal, C. (2023). Studying Artist Sentiments around AI-generated Artwork. ArXiv, abs/2311.13725.
23. Romero. (2020). Artificial Intelligence in Music, Sound, Art and Design. Springer International Publishing.

24. Al Homssi, B., Dakic, K., Wang, K., Alpcan, T., Allen, B., Boyce, R., ... & Saad, W. (2023). Artificial intelligence techniques for next-generation massive satellite networks. IEEE Communications Magazine.
25. Salami, E. (2021). AI-generated works and copyright law: towards a union of strange bedfellows. Journal of Intellectual Property Law & Practice, 16(2), 124-135.
26. Vanherpe, J. (2021). The AI Author - an Artificial Construct?
27. Chiao, V. (2019). Fairness, accountability and transparency: notes on algorithmic decision-making in criminal justice. International Journal of Law in Context, 15, 126 - 139.

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