Artificial Intelligence on Graphic Designing

Influence of artificial intelligence, and prompt engineering on graphic designing and filmography:

A systematic literature review.

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Abstract

Graphic design and filmography are undeniably among the most challenging and demanding sectors in today's world. Just a few years ago, graphic designers faced the arduous task of manually editing images, including the painstaking process of removing backgrounds. This involved designers meticulously using a mouse cursor to erase the background until it was eliminated. However, the advent of Artificial Intelligence (AI) has revolutionized this industry, making tasks like background removal remarkably efficient and saving designers a significant amount of time. AI has emerged as a game-changer for graphic designers, offering a plethora of tools and techniques that simplify and streamline the creative process. The technology's impact is particularly evident in automating tasks that were once painstakingly manual, such as background removal. Designers can now rely on AI-powered software to swiftly and accurately remove backgrounds from images, freeing up their time for more creative and complex aspects of their work. The time-saving benefits of AI in graphic design cannot be overstated. What previously consumed hours of tedious labour can now be accomplished within mere minutes, thanks to AI algorithms that can swiftly and accurately identify and remove backgrounds from images. This efficiency has not only boosted productivity but has also enhanced the overall quality of graphic design work. For this systematic literature review paper, a rigorous methodology was employed to gather relevant information. The process involved exploring journals and articles from reputable sources, including the ACM Digital Library, Google Scholar, IEEE Xplore, and others. The PQ4R theory, which stands for Preview, Question, Read, Reflect, Recite, and Review, was utilized to ensure a systematic and comprehensive review of the existing literature and by checking all the papers on how Artificial intelligence is like a helpful assistant for designers. It makes graphic design easier and improves the final look. AI tools assist human designers by simplifying the process, making it faster and smarter. This technology helps create designs quickly and efficiently, which is not only valuable for theory but also very practical in real-world design work.1]

Keywords

Graphic design, Artificial intelligence, visual communication, Prompt engineering, and intelligence recognition.

Introduction:

In these days, the artificial intelligence has gotten a lot better. It's moved from basic algorithms to more complex ones, like deep learning with lots of layers in the neural networks. Sometimes, AI is even better than humans in certain jobs and situations.

For several years now, artificial intelligence (AI) technology has been steadily making its mark in the realm of art, and its influence has reached deep into various creative fields, including art, production design, animation for television and films, and visual transformation. In the world of contemporary art, AI has become a groundbreaking tool for artists, enabling them to explore innovative and unconventional forms of expression. Artists are leveraging AI algorithms to generate unique pieces of art, blurring the lines between human creativity and machine-generated aesthetics. In product design, AI plays a crucial role in optimizing the design process. Designers can utilize AI-driven software to rapidly generate and refine product prototypes, leading to more efficient and cost-effective development cycles. In animation for film and television, AI-driven techniques are transforming the industry. AI can automate labour-intensive tasks like character animation, rendering, and even scriptwriting, significantly reducing production timelines and costs. Visual communication design, which is a keyway that artificial intelligence is used, has a big impact on our daily lives. It affects things like ads we see, how we recognize brands, posters, books, and displays [1].

In the past, people have tried to use artificial intelligence in art. For example, Google made a model called Sketch-RNN in 2017 that can draw simple lines. In 2018, at a conference in the UK, Tao Zhou and others proposed a model that can imitate graffiti and water colour paintings. Alibaba, a big company, created a robot called "Luban" that can learn different aspects of poster design and make 8000 posters in a second. This helps designers work faster. Today, artificial intelligence helps make designing easier for humans. It can create many different designs. In one study, scientists used a tool to tell if an image was good or not, and then they used that tool to make the design even better.

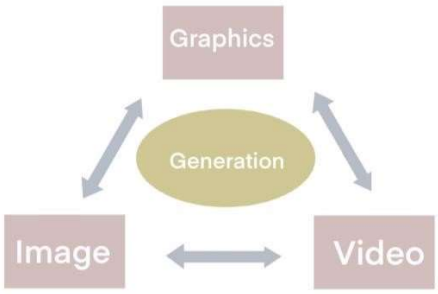

Figure 1 Luban's visual generation system

Challenges faced during the research:

We can see that artificial intelligence has improved how we make visual art, both in the ideas behind it and in practical use. However, there are still some difficulties when AI is used in the world of art. These difficulties involve different problems, such as:

1. **Interpretation and Creativity** AI, although capable of generating art, often lacks the deep understanding, emotional connection, and creativity that human artists bring to their work. It struggles to interpret art in the same nuanced way a human can, potentially missing the subtle messages and emotions conveyed in a piece.

2. **Originality and Plagiarism**: AI's ability to create art raises concerns about originality and plagiarism. There is a risk that AI-generated art may inadvertently replicate existing works or follow popular trends, diluting the uniqueness and authenticity associated with human-created art.

3. **Considerations of ethics**: Using AI in art brings up questions about who owns the art, whether it's like regular property or not, and who gets credit for making it. Figuring out these things is legally and ethically tricky.

4. **Fairness**: AI programs can keep the unfair ideas from the data they learn from, which can make AI-made art unfair too. This might make stereotypes stronger or leave out voices that don't get heard enough. It shows why it's important to pick data and programs carefully.

5. **Technical Limitations**: AI algorithms may struggle with complex or abstract art forms, limiting their ability to contribute meaningfully to certain genres or styles of visual art.

6. **Human-AI Collaboration**: Finding the right balance between human and AI involvement in art creation is an ongoing challenge. Artists and researchers are exploring how to best leverage AI as a tool, rather than a replacement, for human creativity.

7. **Emotional Connection**: While AI can create visually stunning art, it often lacks the emotional depth and personal connection that viewers may experience with human-created art.

Addressing these challenges involves ongoing research, ethical considerations, and creative exploration to ensure that AI's involvement in visual art enhances rather than diminishes the field, ultimately broadening the horizons of artistic expression.

Methodology:

To gain a comprehensive understanding of how Artificial Intelligence (AI) impacts the field of Graphic Designing, we employed a systematic approach. This method allowed us to delve deep into the subject matter. We specifically chose to scrutinize research papers from reputable sources like the IEE and ACM digital libraries due to their stringent standards and reputation for providing reliable information.

After sifting through the results, we identified and selected 17 pertinent research papers. Subsequently, we conducted a thorough review of these papers and further refined our selection to the most relevant 12 papers from the before mentioned digital libraries. This meticulous process ensures that our paper is firmly rooted in well-founded research and accuracy.

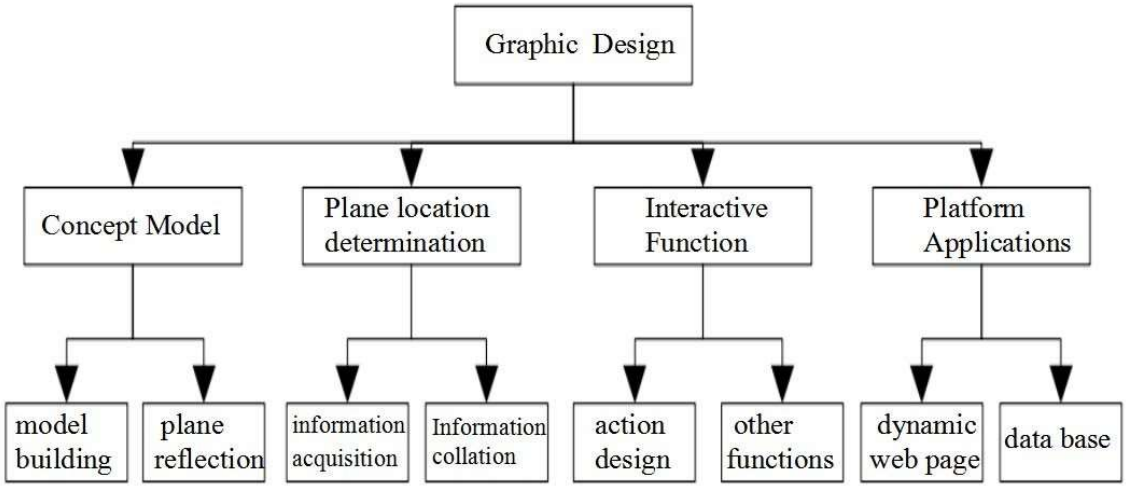

Figure 2 A schematic diagram illustrating the specific steps involved in implementing AI interaction technology.

My personal journey as a graphic designer, starting in 2019, has exposed me to the labour-intensive task of manually removing backgrounds from images, videos, and various file formats using Adobe tools like Premiere Pro, Photoshop, After Effects, and Da Vinci Resolve. Faced with these challenges, I sought feedback from my fellow designers by sharing a review link within our design community. I aimed to gauge their perspectives on integrating Artificial Intelligence applications into graphic design tools and how AI could potentially impact the speed and overall design environment.

Motivated by my own experiences and the insights gathered from fellow designers, I felt compelled to take a stance and embark on this systematic literature review. Its primary objective is to explore the profound influence of Artificial Intelligence on graphic designing and filmography, shedding light on the transformative role of AI in these creative domains.

AI algorithms used in landscape design can assist designers in obtaining detailed landscapes and converting them into flat backgrounds. This smart feature is primarily executed within a virtual

environment. In this virtual space, the designer establishes a signal transmitter to measure time and calculate distances. Here's how it works:

First, the designer creates a signal transmitter within the virtual platform to track time. Then, they determine the landscape's specific location by using signals. Here's how it's done:

$S = (T - T_1)V$

In the given formula, S stands for the distance between the signal sender and the device receiving the signal on the same horizontal line. T represents the time the signal is sent, T1 is the time it's received, and V is the speed at which the wireless signal travels. Using this formula, designers can precisely figure out where a landscape should be positioned.

However, if the distance between the signal sender and the receiving device is quite far, it's tricky to accurately measure the distance using just one signal. So, in the virtual platform, two models are used. By calculating the time difference between both signals, the distance can be precisely determined.

Once the physical landscape's location is known, designers save this data in the virtual platform. Additionally, they create a new plane and transfer the data from the physical landscape onto it. Finally, designers adjust the physical image on the plane, resulting in the creation of a background map.

Results:

Expertise diversion: Despite AI's notable achievements in certain domains, it has exhibited drawbacks in the realm of design due to its own evolution. One notable drawback is the propensity for AI to generate designs that lack diversity and may appear overly similar or homogeneous. Consequently, graphic designers are encouraged to continuously enrich their professional expertise, proficiently navigate graphic design software, grasp design theory, and maintain a mindset of keeping pace with technological advancements. This approach ensures that designers remain adaptable and capable of infusing creativity and uniqueness into their work, effectively countering the uniformity that AI-generated designs may inadvertently introduce.

Science and Technology: Many designers hold the belief that possessing a strong aesthetic sense, comprehensive knowledge of visual communication, and ample experience are sufficient for creating exceptional design. However, the dynamic nature of graphic design demands an integration of technology. In essence, design should encompass a fusion of artistic creativity and technological innovation. For instance, consider the evolution of web design. While aesthetic principles remain important, the rise of responsive design has required designers to incorporate coding skills. Creating websites that adapt seamlessly to various devices and screen sizes involves not only visual creativity but also technical proficiency in HTML, CSS, and JavaScript. This exemplifies how contemporary graphic design necessitates a synthesis of artistic and technological elements to deliver impactful and user-friendly solutions.

Innovation: Developers and graphic designers have the potential to seamlessly merge two distinct entities—artificial intelligence technology and graphic design—ultimately resulting in a novel design content that surpasses the quality of the initial independent components.

Art: It will maintain a steadfast focus on the established principles of formal aesthetics, infusing a sense of vitality into the conventional artificial intelligence assistance program [5]. To make tangible advancements in the field of art, the initial step involves incorporating pertinent artistic principles into the domain of graphic design. This will empower computers to not only generate graphics but also discern and differentiate them based on these foundational principles.

Discussions:

Artificial Intelligence (AI) has significantly transformed the fields of graphic design and film production, revolutionized creative processes and broadened the possibilities in both domains. This impact can be attributed to several factors, including automation, enhanced efficiency, and the augmentation of human creativity.

One prominent way in which AI has shaped graphic design is through automation. AI-driven tools have streamlined labour-intensive tasks such as background removal, colour correction, and even the generation of complete design concepts. For example, designers can now utilize AI algorithms to swiftly and accurately remove backgrounds from images, resulting in considerable time savings. Consequently, designers can channel their efforts into more creative aspects like concept development and artistic expression.

Moreover, AI's influence extends to prompt engineering within the realm of graphic design. Prompt engineering entails generating creative ideas or design concepts guided by predefined prompts or criteria. AI-driven prompt engineering tools, like GPT-3, have the capability to offer immediate creative suggestions or even produce entire design concepts. This collaborative interaction between AI and designers enriches the ideation phase, nurturing inventive thinking and leading to the creation of innovative and distinct design solutions.

In the sphere of film production, AI has brought about a revolution in various aspects of filmmaking. A notable influence lies in post-production tasks such as video editing and the application of special effects. AI-powered software can automate functions like video stabilization, colour grading, and the generation of realistic visual effects, reducing the time and effort required while maintaining a high level of quality.

Prompt engineering in film production has also reaped the benefits of AI. Screenwriters and directors can employ AI-powered tools to generate plot ideas, character dialogues, and even entire scripts based on specific themes or genres. This not only expedites the pre-production phase but also introduces fresh and imaginative inputs that can serve as inspiration for filmmakers.

Additionally, AI has reshaped the audience's viewing experience through personalized content recommendations. Streaming platforms like Netflix and Disney+ utilize AI algorithms to analyse user preferences and viewing patterns, delivering tailored recommendations for movies and TV shows. This personalization enhances viewer engagement and satisfaction.

In summary, AI's impact on graphic design and film production encompasses a multifaceted approach, influencing various facets of the creative process. Through automation, prompt engineering, and personalization, AI has elevated efficiency and creativity in these fields, paving the way for exciting advancements and innovations in visual arts and storytelling. As technology continues to advance, the synergy between AI and human creativity promises to yield even more remarkable results in the realms of graphic design and film production.

References:

[1] R. Boix-Domenech and V. Soler-Marco wrote a paper in 2017 about how creative businesses in different places affect how well those areas do economically.

[2] In 2016, J. Johnson, A. Alahi, and F. Li published a paper on using computer tricks to make pictures look different and better in real-time.

[3] Muzi Qu, Yaxuan Liu, and others from the Yuan Feng College wrote about how artificial intelligence can help with graphic design in visual communication.

[4] W. Chen, Z. Xu, S. Shi, Y. Zhao, and J. Zhao did research in 2018 about how blockchain technology is used in different fields.

[5] In a paper titled "A Novel Genetic Algorithm Based on Tabu Search for HMM Optimization," authored by F. Yang, C. Zhang, and G. Bai, presented at the Fourth International Conference on Natural Computation in 2008, a new genetic algorithm incorporating tabu search for optimizing Hidden Markov Models (HMMs) is discussed.

[6] Exploration on the application of artificial intelligence elements in Graphic Design by Shuyen Li

[7] An article authored by A. Radford, L. Metz, and Chintala titled "Unsupervised Representation Learning with Deep Convolutional Generative Adversarial Networks," published as an arXiv preprint under the reference arXiv:1511.06434 in 2015.

[8] A work authored by Susmit Bagchi titled "Distributed Computation Using Evolutionary Consciousness: An Approach," featured in the International Journal of Computational Intelligence in 2015.

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[10] In 2000, Y.Z. Li authored a book titled "Vision Conveys the History and Aesthetics of Design," which was published by China Renmin University Press.

[11] In 2018, Y. Jin and Z. B. Lu conducted research on the artistic integration of "one integration, two groups, and three senses" in graphic design, using lacquer painting creation as an illustrative example. This research was featured in the journal "Fine View."

[12] In 2018, H. Y. Song explored the connection between information communication and the evolving audience dynamics within the changing economic landscape in the context of the new media environment.