
Artificial intelligence's influence on improving the speed at which artwork is extracted for interior design

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Abstract:

This study discusses Artificial intelligence's influence on improving the speed at which artwork is extracted for interior design compared to traditional methods. AI technologies generate creative ideas, providing designers with techniques to select, create and link art in interior spaces using examples, techniques and laws provided by AI devices and software to speed up the workflow in design, and work to complete projects faster while maintaining aesthetic and creative quality and accuracy in work.

The study relies on a mixed methodology that combines questionnaires, interviews and case studies to test the quality of AI technology in developing art extraction. It includes several techniques to improve speed, creativity, appropriate costs, and balance between deduction and implementation. The results show that demonstrate the ability and advantages of AI in reducing time and effort, despite the difficulty and challenges in how designers deal with these new technologies and how to operate them. As well as the traditional methods with all their advantages, beauty, elements and accuracy, take a very long time to extract art.

Keywords: Artificial intelligence's, improving , speed, artwork extracted, interior design.

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Introduction:

Interior design always relies on the integration of practical and aesthetic functions, with art playing a fundamental role in defining the environment and appeal of a space. The process of integrating art into design is a difficult process, requiring careful study of space elements, cultural compatibility, and aesthetic harmony. Despite the creativity and application of traditional methods of art, it is time-consuming and may not provide the required speed and accuracy in design work. [1]

In the world of interior design, artificial intelligence is being used as a means to make the process of extracting, analyzing, and integrating artwork into spaces more advanced. The only limit is the quality of the data available for extracting artwork, which allows designers to run processes to speed up the art extraction process, as well as maintain or even improve the quality of the work.

The problem of previous years was that the field of interior design in interior spaces relied on traditional methods such as manual work that takes a long time to

understand, develop, and identify design elements for implementation. Artificial intelligence emerged to develop through it and revolutionize the speed and efficiency of extracting artworks, to obtain, select, and apply artistic elements to interior spaces.

Research question

- What are the advantages and disadvantages of AI in artwork extraction compared to traditional methods, in terms of time efficiency and design quality?
- How does AI artwork extraction affect clients in general for interior design projects?
- Can AI artwork adapt to different cultural and functional requirements in diverse interior design projects?

Research aim

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This study aims to investigate Artificial intelligence's influence on improving the speed at which artwork is extracted for interior design.

Research objective

Clarify how can artificial intelligence accelerate the process of art extraction and compare it to traditional methods.

- Identify the ability of artificial intelligence to select artworks appropriate to the interior space.
- Knowing how can artificial intelligence develop creative elements in the selection and application of art.
- Comparing the artistic results of artificial intelligence methods with traditional methods in terms of speed, design quality and customer satisfaction.

Importance of the research

This research includes combining artificial intelligence with the development of art in interior design. The research talks about the ability of artificial intelligence to accelerate design processes by improving the speed of extracting art, and helps designers adhere to project deadlines while maintaining high quality and accuracy. It also emphasizes the importance of artificial intelligence techniques in developing creativity by creating advanced and intelligent designs, methods and artistic forms while maintaining the human artistic character in design.

It also talks about improving economic efficiency through the fact that artificial intelligence simplifies the processes of deducing art, and reduces the time and effort associated with traditional methods. The research addresses the gap between technology and design, and provides important theories for designers, architects and creators about developing the exchange of ideas in the period of combining art and technology.

The research emphasizes the importance of developing compatibility between humans and artificial intelligence, as artificial intelligence has the ability to complement and develop human creativity instead of replacing it, and determines fixed and appropriate rules for integrating technology with design. The research established that artificial intelligence was able to deduce and develop customers' ideas and innovative designs that suit spaces and customer requirements.

In general, the research explains the potential of artificial intelligence to revolutionize interior design by working

on technical conclusions, improving results, and developing creativity in creating artistic and practical interior spaces.

Research Limitations

- Spatial boundaries: It is not limited to specific places, but rather to designers.
- Temporal boundaries: From the beginning of the research release 2024-2025
- Limits of objectivity: The research focuses on Artificial intelligence's influence on improving the speed at which artwork is extracted for interior design.

Literature Review

The computer has become an easy and distinctive means of design and artistic expression, and it has become a new and distinctive tool used by designers to create designs and work to bring about advanced and radical changes in the beauty of artistic designs and how to develop thinking to create harmonious designs for art. [1] Modern AI supports design to greatly improve and develop the quality and ability of computer-aided design in modern art, making it a fundamental practical path and an important development method in modern art design. [1] The main point of interactive art design is the interaction between people, works and tools. The importance of applying artificial intelligence and linking it into interactive art design is great, so we must adhere to the principle of humanization. [1] The combination of artificial intelligence and CAD mechanism in interactive art design strengthens the efficiency of human-computer interaction in art design, which improves artworks and human sensory experiences. [1] With the advent of advanced AI standards, we can leverage text descriptions to create aesthetically appealing designs that are eye-catching and capable of addressing consequences. [2] The method provides designers with distinctive, attractive and beautiful design solutions in interior design, by developing text descriptions, it works to produce quick solutions for design principles, and designers can use it in other design areas while taking into account the right balance, which works to develop interior design..[2] AI enables organizations to advance and evolve on traditional human-centered design qualifications by extending and magnifying the technology beyond traditional boundaries and evolving its techniques to learn and fit into spaces..[3] With previous research on generative AI models for quickly knitting 3D shapes and designs, it provides simple

explorations of texture possibilities for the designer. [4] There is little knowledge of the use of generative AI techniques in design and related fields, especially in converting text to images to weave and develop 3D shapes and designs. [4] All eyes on the key developments and benefits of integrating AI into creative and innovative industries. [5] AI has the potential to transform this approach by amplifying human creativity, automating repetitive tasks, and extracting hidden insights from massive reports. [5] AI-powered generative design enables rapid design development and replication, which significantly reduces the time and cost of product development. [5] As industries continue to explore and evolve the nexus of AI, they must also prioritize responsible AI practices and invest in developing a skilled workforce to harness the transformative potential of AI in design and innovation. [5] The goal of artificial intelligence in the computer field is to create intelligent machines and resources capable of performing the required tasks that depend on human intelligence, and these tasks include understanding the flows of nature, recognizing patterns, making decisions, learning from errors, and solving complex problems. [5]

METHODOLOGY

The study is in line with the mixed approach of collecting and analyzing qualitative and quantitative data in order to measure the effects of artificial intelligence in creating art. Data collection, analysis, examination of results, and machine learning versus traditional methods combine all these key aspects that the study investigates.

1. Research Design:

Mixed Research Method: Mixed methods research method will be applied to less the perspective of the output of artificial intelligence in artistic illustration. Through integration of statistical data as well as consultations of experts in this domain, the study tries to achieve an objective perspective.

2. Data Collection:

Questionnaires: These will be distributed questionnaires against interior designers, architects and design professionals for their opinions on the effect of artificial intelligence on the process of art illustration. The questionnaire contains closed and open questions to gather quantitative data and qualitative opinions about the contribution of artificial intelligence to conditions of design, creativity, and work improvement.

Interviews: Interior designers will be interviewed regarding the usage of artificial intelligence methodologies within design processes. The discussions explain how AI is being utilized, its benefits and recent advancements, as well as how it contributes to the processes of creative decision-making and work generation.

SURVEY

This questionnaire aims to collect the opinions of designers, artists and creatives about their experiences and information about artificial intelligence and its impact on improving and developing the extraction of artworks in a faster, more accurate and more beautiful way that suits all different spaces.

This survey answers the second and third questions according to the quantitative methodology used in the research.

<https://forms.gle/NeSHg9a8MhY34hJm6>

Data analysis

A questionnaire was used to collect opinions from interior designers, architects, and design professionals about the impact of AI on the art interpretation process. The questionnaire was distributed to 58 people, with 50 responses collected. However, two responses were excluded, resulting in 48 valid responses. The questionnaire contained closed and open questions to collect quantitative data and qualitative opinions about the contribution of AI to improving design conditions, creativity, and work efficiency.

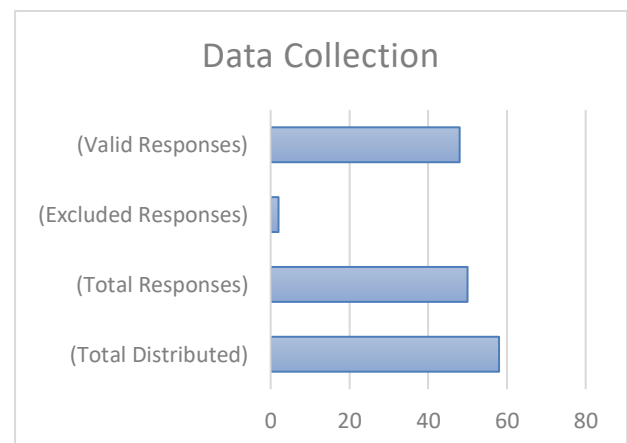


Figure 1 Show Data collection

RESULTS AND DISCUSSION

1. Survey:

• Age range

Participants were categorized by age group and years of experience, with the 20-25 age group showing the largest percentage of interior designers, while other categories of professionals and students stand out in varying numbers.

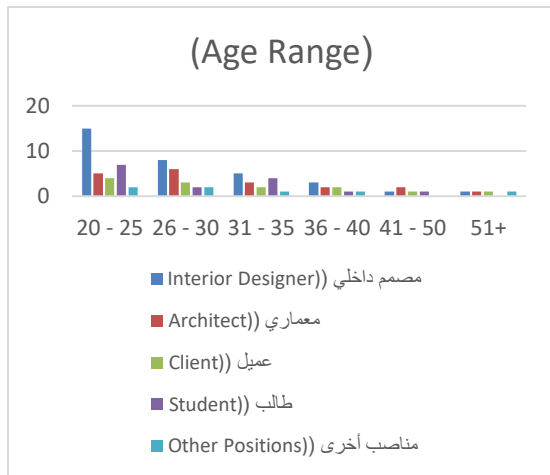


Figure 2 Show Age range

• Years of experience

The data also shows that most participants have experience ranging from 0 to 1 year, indicating that artificial intelligence can play a vital role in accelerating the learning process and adapting to modern trends in design. By analyzing these results, we can understand how artificial intelligence contributes to improving efficiency and innovation in interior design.

Question	Answer	Count	Percentage (%)	Mean	Standard Deviation	Coefficient of Variation
1.	I know a lot	12	25%	1.92	0.75	39.10%
	I know a little	28	58.33%			
	I know nothing	8	16.67%			
2.	Yes	20	41.67%	1.57	0.5	31.80%
	No	28	58.33%			
3.	Strongly agree	16	33.33%	1.98	0.8	40.40%
	Agree	20	41.67%			
	Neutral	6	13%			
4.	Disagree	6	13%	2.05	0.79	38.50%
	Strongly agree	13	27.08%			
	Agree	19	40%			
	Neutral	10	20.83%			
	Disagree	6	13%			

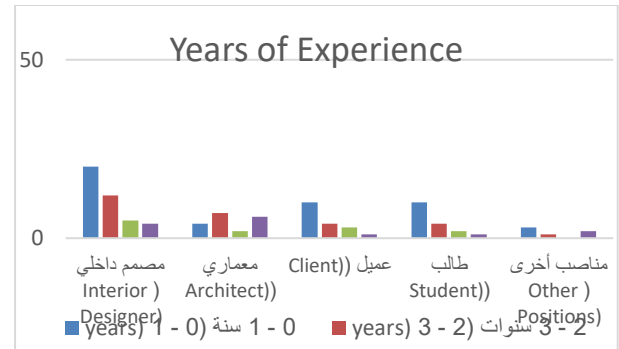


Figure 3 show years of experience.

Table 1 show the question 4-7 answering in survey.

Table 2 show the question 8-10 answering in survey.

Question	Answer	Count	Percentage (%)	Mean	Standard Deviation	Coefficient of Variation
5.	Much less	11	22.92%	1.89	0.8	42.40%
	Slightly less	18	37.50%			
	Almost the same	10	20.83%			
	Much higher	6	13%			
6.	Strongly agree	6	12.50%	1.88	0.8	42.60%
	Agree	20	41.67%			
	Neutral	14	29.17%			
	Disagree	8	17%			
7.	Strongly agree	10	21%	1.93	0.75	38.90%
	Agree	20	41.67%			
	Neutral	13	27%			
	Disagree	5	10.42%			

Table 3 show the question 11-13 answering in survey.

Q.No.	Answer	Count	Percentage (%)	Mean	Standard Deviation	Coefficient of Variation
8.	Yes	7	14.58%	1.72	0.58	33.70%
	No	30	62.50%			
	Neutral	11	23%			
9.	Support for traditional techniques	22	46%	1.55	0.5	32.30%
	Alternative to traditional techniques	26	54%			
10.	Yes	40	83.33%	1.25	0.45	36%
	Maybe	6	12.50%			
	No	2	4.17%			

The survey showed that AI in design is seeing increasing interest, with 58.33% of respondents indicating that they know little about the technology, reflecting the need for increased awareness and education about AI. However, 41.67% of respondents have experience using AI in their projects, indicating a gradual adoption of the technology in the industry. The results also showed that AI contributes significantly to increased productivity, with 67.08% of respondents believing that it speeds up project completion, and also contributes to reducing costs by

60.42%. On the other hand, it was found that AI can effectively meet specific design requirements, with 62.5% of respondents believing that it can meet these requirements well. However, there are some reservations regarding the compatibility of artworks with cultural aesthetics, with 29.17% of respondents feeling neutral about it and 16.67% disagreeing with the suitability of AI to cultural aesthetics. However, the use of AI as an alternative to traditional technologies is widely supported, with 54.17% of respondents preferring AI to be an alternative rather than just an assistive tool. Ultimately, the results showed strong support for the use of AI in the future, with 83.33% of respondents recommending the continued use of these technologies, reflecting great optimism about the future potential of AI in improving design processes and increasing their efficiency, while taking into account cultural and aesthetic aspects to meet the needs of the diverse market.

2. Discussion :

- Advantage and disadvantage

Huang 2024 in This study discusses methods that rely on artificial intelligence, such as computer vision and neural networks, through which the automation of the extraction of design elements such as lines, colors and foundations from drawings is done. This mechanism improves accuracy and efficiency to a greater extent and reduces the occurrence of errors and problems compared to traditional methods. It facilitates methods of renewing the structure in the design using CAD programs to provide techniques for designing in a more advanced and accurate way and for ease of modification and development. Among the evidence and examples: The results of the reduction in error rates that occur when matching images from 9-10% to 3-5% were extracted through the improved methods, and thus the data results were improved. [6].

While Zhou and Lee 2024 in their study confirms that modern AI tools can infer outputs that are considered creative by traditional society, including generative AI systems that convert text to images and operate on automated human-inspired processes. AI-based text-to-image technology improves human output and creativity by 25% and increases by receiving 50% better work. They prove that generative AI significantly improves traditional hand production and produces positive outputs. Here, it is confirmed that human creativity and artistic techniques in developing the success of the artist are based on and using elements of generative AI. [7]

On the other hand, Laraichi and Tornquist 2024 in their study had a study that talks about providing AI-powered design solutions at lower costs compared to traditional design thanks to reduced labor costs and faster work completion through advanced AI elements. Choosing between smart design and outsourcing traditional graphic design is very important for companies to improve production, and both designs have design advantages.

As for AI-based design, in automating the design faster, it saves costs and reduces the repetition of designs, and it is an ideal option for developing the company's production faster and more widely. From another perspective, design using the traditional method that relies on the human touch has personal experience and knowledge of market methods, which is also useful for projects with specific goals. This company has a website that proves the advantage of using AI in design and the extent of its development for the company, and it is a company available in 5 countries. [8]

Aalso Chrystal R. China / 2024 in her article talks about the advantages and disadvantages of artificial intelligence and compares it to traditional methods. It speaks more broadly to all fields. Artificial intelligence works over a wider range, while traditional methods work over a limited range and with limited interventions. Most companies now rely on artificial intelligence in several matters, and this is an advantage because the required work is completed in one hour instead of a week, which leads to speed of production, development, accuracy and reduced costs. However, one of the disadvantages is that there are fears of the workforce that in the long run there will be unemployment in several jobs. I confirm that despite all these matters, companies must use artificial intelligence because it gives them the opportunity to keep pace with the developing world, and through it artificial intelligence technologies face this development with technologies that deal with it accurately. [9]

Li et al. in their study discusses how artificial intelligence works to reconstruct the design work. It is used to prove the impact and advantages of artificial intelligence on graphic design through a critical interpretive synthesis approach. After studying 33 researches, it was proven by discovering four examples of artificial intelligence in graphic design, AIDAG, AGDIP, AACDP and AVAERM, which are artificial intelligence-based design, intelligence-assisted image processing research, research that works to develop creative art and design

techniques, and research that develops visual attention and emotional response. From these models, artificial intelligence works to develop design and develops the creative, distinctive and accurate thinking of the workforce. The study proposes that these models be operated with the support of traditional design to provide a significant development in design ideas that produce effective and advanced productions on design for the future. [10]

As well as Echevarria and Zheng / 2021 in their research talks about the time-consuming of finely designed artworks, so it studied how to develop machines with artificial intelligence to draw like humans, which is a tool that helps humans, and this method works in a way that divides the design into a more precise form in a sequential manner, and they propose an approach close to the human method, which is intelli-paint, and through it it has been proven that it is able to draw canvas paintings more similar to human work and in a sophisticated and supportive way for their work by using strokes with a limited number of brush strokes and it is reduced by 60-80% of the number of brush strokes required to display the required paintings with the required accuracy and speed, so the experiments confirm by comparisons with previous marginal methods that it not only shows its percentage of development and noticeable improvement, but also shows the drawing style that is more related to the work of real humans.[11]

Finally:

these studies emphasis that the qualitative methodology in terms of advantages is that AI has advanced advantages and capabilities to produce in a faster time period and at lower costs, reduce human errors, improve customer satisfaction, produce designs in a style that is no different from the human style, produce designs in an accurate and creative manner that complements traditional methods, and expand ideas and development in artistic expression

- **Disadvantage**

Ahmad and sutoyo 2023, with seli 2023 and Bhullar 2024 in their researches talks about the disadvantages of artificial intelligence, which revolves around the fact that there is a bias towards works produced by artificial intelligence, and also that it will cause unemployment and affect artists, and also that there are restrictions on the

development and creativity of artificial intelligence. Why is there a negative bias towards works produced by artificial intelligence because it has reduced the story and effort of design in terms of judgments and sensory feelings. And why does it affect artists and designers because we will lose traditional works and unemployment and change the basics of artistic design. And why are there methods limited to creativity and development? It is true that artificial intelligence increases production, but there is a loophole in that artificial intelligence shows the design with quality and the extent of development and creativity of the design and how it flows with the spaces and culture of the place.[12],[13].[14].

Finally: There is a lack of information about artificial intelligence and its assistance in design from several aspects, with the possibility of artificial intelligence not being able to produce designs in a creative way that takes into account the originality and culture of entertainment, concerns about unemployment and lack of human labor, and that there is no balance between artificial intelligence technologies and traditional technologies, and that it affects traditional methods in general in design, and after researching these problems in several researches that exceed the number of researches that oppose artificial intelligence and are supported by the results of the questionnaire that was also distributed and analyzed, that artificial intelligence reflects these disadvantages and concerns positively and takes into account all these issues, but there may be a lack of sufficient knowledge and awareness about the advantages of artificial intelligence and its development, and these technologies are not a substitute for human hands, but on the contrary, they support them and provide cooperation with human hands in a more advanced, more accurate, creative, faster way and with many advantages. .[12],[13].[14].

CONCLUSION

The study addresses the impact of AI on improving the speed of interior design artwork extraction, and the results highlight that the majority of participants have limited or moderate knowledge of AI in design, with only a small percentage demonstrating extensive experience. More than half of participants have not been involved in

projects using AI, indicating limited current adoption of these technologies.

AI is seen as speeding up project completion, with around 68% agreeing with its potential efficiency. Many participants believe that AI-based projects are relatively less expensive than traditional methods. However, there is a mixed perception regarding the cultural compatibility of AI-generated artwork.

14.58% of participants reported challenges in applying AI to cultural or functional projects, although the majority (83.33%) expressed their willingness to recommend working with AI technologies in the future.

Recommendation

To fully harness the potential of AI in design, it is essential to raise awareness and understanding among designers. This can be achieved by organizing workshops and training programs that focus on AI applications and benefits in creative processes. Encouraging greater adoption of AI in projects by providing resources and support will help designers increase efficiency and reduce costs. Additionally, addressing cultural compatibility issues in AI-generated designs is essential to ensure they better engage with diverse audiences. It is important to position AI as a supportive tool that complements traditional design methods, rather than a complete replacement for human expertise. Finally, investing in AI-based initiatives and fostering a positive attitude towards its use can pave the way for innovative and effective design solutions in the future.

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