



Enhancing Interior Spaces with Artificial Intelligence: A Comprehensive Study

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Abstract: The application of artificial intelligence in interior design significantly improves the quality of interior spaces, enhancing occupants' creativity and productivity and improving their mood and health. AI use can also tailor environments to users' specific needs and contribute to smarter, more comfortable interiors. By increasing environmental efficiency and reducing resource consumption, the integration of AI into interiors can also promote sustainability. This study focuses on the application of AI in interior design and its impact on improving the quality of interior spaces. It examines various areas in which AI can be implemented—such as homes, offices, educational institutions, and healthcare settings—and how it contributes to enhancing comfort and productivity. The study also highlights the growing need for innovative and sustainable approaches to designing interior spaces that meet people's needs and promote their well-being. The findings show that integrating AI into interior spaces improves environmental efficiency and reduces resource consumption, lowering the environmental impact of interior spaces and promoting sustainability. This personalized approach improves the satisfaction and well-being of occupants, as AI systems learn and anticipate users' needs over time. Furthermore, AI-driven interior design solutions have the potential to revolutionize how we interact with built environments, creating dynamic, responsive spaces that evolve with changing requirements and lifestyles.

Keywords: Artificial intelligence, Interior space, Sustainability, Smart homes.

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1. Introduction

The notion of artificial intelligence (AI) dates back to ancient times, as evidenced by historical references to Pope Sylvester II's supposed invention of a "robotic" bronze head that could respond to yes-or-no questions. Today, technological progress has led to highly sophisticated tools, including AI applications, that improve the interior design process and the way users interact with indoor spaces.

These advancements have enabled interior design to meet the needs of modern life by creating environments that are more comfortable, secure, and sustainable. The integration of advanced technologies into indoor spaces can result in settings that are functional, visually appealing, and tailored to contemporary lifestyles. The use of eco-friendly materials and energy-efficient systems further enhances these spaces.

AI enhances the quality of interior spaces by creating methods to assess design programs, improving outcomes through indoor environmental quality indices, and developing comprehensive evaluation systems [1]. It helps identify flaws in design plans, maximizes benefits, reduces construction changes, increases design reliability, and speeds up implementation [2]. Additionally, AI supports human-centered design by addressing user needs and creating evaluation systems for interior decoration solutions [3].

AI also enhances technical innovation in interior design through the use of precise 3D models and lifelike simulations [4]. Comparative studies on AI platforms in interior design have shown that the use of AI

promotes innovation and efficiency, having positive effects on project completion time, design accuracy, and client satisfaction [5]. Integrating AI into interior design improves solutions, optimizes processes, and enhances the user experience, significantly impacting smart buildings and education.

AI-enhanced software improves information sharing among designers and advances the industry. Case studies such as that put forward by Kujiale demonstrate the practical applications of AI in environmental design [6]. Moreover, AI's role in distance learning, though not specific to interior spaces, has a broader impact on user experiences and outcomes [7]. AI can revolutionize interior design by enhancing comfort, productivity, and sustainability in residential, commercial, educational, and healthcare spaces, reducing resource consumption and promoting sustainability.

AI's significance in interior design lies in its ability to revolutionize space conceptualization and user experience. It streamlines the design process by generating realistic visualizations and providing data-driven recommendations, leading to more efficient and cost-effective solutions. As technology progresses, AI's role in interior design has become increasingly vital, but despite the increasing importance of AI use in interior design and the promise of its integration into design processes, we lack an adequate understanding of AI's impact on interior design processes. This study aims to address this gap by exploring AI's role in enhancing quality of life in indoor environments. Specifically, it focuses on how AI can balance comfort, aesthetics, and functionality, while investigating the optimal use of AI technologies to create personalized experiences.

This study examines AI's impact on the quality of interior spaces, aiming to identify challenges across all interior design domains, enhance quality of life, promote sustainability, and increase artistic awareness. It focuses on AI applications in interior design, particularly in improving interior environments, and emphasizes developments since 2010, excluding historical trends and future projections. The hypothesis suggests that the use of AI applications in interior design significantly enhances the quality of interior spaces, leading to behavioral and lifestyle changes characterized by increased comfort, luxury, safety, and sustainability. The methodology combines a descriptive approach to document and analyze the application of AI in interior spaces with an inductive review of relevant studies and articles.

2. Methodology

This study examined AI's impact on interior space quality since 2010, identifying challenges in design to improve quality of life, sustainability, and artistic awareness. The methodology combines a descriptive analysis of AI applications in interior design with an inductive review of previous research. It suggests that AI significantly enhances space quality, leading to changes in comfort, luxury, safety, and sustainability.

3. Study tool

Significant advancements in interior design and AI have mirrored societal developments throughout history. The concept of AI dates back to legends found in antiquity referencing Pope Sylvester II's supposed invention of a bronze head that could answer binary questions. Today, sophisticated AI tools enhance interior design and user interaction, creating spaces that promote well-being and satisfaction. These tools ensure that modern interior designs are more comfortable, secure, and sustainable. The integration of advanced technologies into indoor spaces results in functional and aesthetically pleasing environments, further improved by the use of eco-friendly materials and energy-efficient systems. This study explores AI's role in enhancing daily life through personalized interior design experiences that balance comfort, aesthetics, and functionality. By generating realistic visualizations and data-driven recommendations, AI transforms space conceptualization and user experience, making the design process more efficient and cost-effective.

AI—an overview

AI is a complex area of computer science focused on developing intelligent machines capable of performing tasks that typically require human cognition [8]. AI development includes machine learning (ML) and deep learning (DL), which allow computers to learn from data [9], with growing attention to explainable AI,

which improves system transparency [10]. AI is divided into categories based on capabilities: reactive machines, limited memory, theory of mind, and self-aware AI. It is also classified by technological advancement into weak AI, strong AI, and superintelligence [11]. Additionally, AI is categorized as artificial human intelligence (AHI), artificial machine intelligence (AMI), and artificial biological intelligence (ABI), representing different research orientations [12]. AI has applications in healthcare, where it aids in data analysis and diagnosis [13]. and in marketing, where it enhances strategy. It also plays a crucial role in driving digital transformation across various sectors [14].

Definition of AI

The term “artificial intelligence” was first introduced in 1956 at a scientific symposium held at an American university, focusing on principles for solving logical rather than mathematical problems. The term “intelligence” refers to the ability to engage in cognitive reasoning. AI involves the study and design of systems or devices that perceive their environment and emulate human actions. Another definition describes AI as a field dedicated to understanding human intelligence by developing computer programs that simulate intelligent behavior.

In computer science, AI seeks to develop systems and programs capable of performing tasks that require human-like understanding and analysis. It relies on advanced technologies such as ML, data analysis, natural language processing, and robotics, with the potential to enhance human life and increase efficiency across various domains. The definition of AI remains a subject of ongoing academic discourse, with diverse perspectives presented in the literature. AI is generally conceptualized as a branch of computer science and engineering focused on developing systems that exhibit intelligent behavior. This includes activities typically associated with human cognition, such as decision-making and creativity [15].

Defining AI without anthropocentric criteria presents challenges, leading to proposals for classifying it based on different levels of intelligence [16]. The literature offers conflicting perspectives on the nature of AI, calling for a nuanced understanding that includes ethical considerations [17] and its impact on human creativity. In the sphere of governance, the legal and tax implications of AI require precise definitions for effective regulation. Edge AI introduces elements of networked environments and real-time data processing [18]. Additionally, AI's integration into supply chain management illustrates its practical application in specific domains [19].

Types of AI

Weak AI: Narrow or weak AI systems are designed to execute a single function. A prime example is the voice assistant found on mobile phones, which can respond only to certain queries and execute particular commands. Currently, weak AI is the most widespread and accessible form of AI.

General AI: This category of AI operates with capabilities akin to human cognition, allowing machines to reason and strategize independently in a manner resembling human thought processes. The systems in this category aim to comprehend the world in a manner that mirrors human understanding. Strong AI systems can handle various tasks, display contextual understanding, and apply knowledge to different domains. However, it is worth noting that there are currently no practical implementations of this type of AI.

Superintelligence: Superintelligent AI is expected to surpass human intelligence across all domains. There are two primary models. The first focuses on understanding human thoughts and emotions that influence behavior, though it has limited social interaction capabilities. The second, known as the theory of mind model, can express individual thoughts, anticipate the feelings and attitudes of others, and engage with them. This represents the next generation of highly intelligent machines. However, at present, superintelligence is only a speculative attempt to envision AI's potential advanced capabilities, and such AI remains in the experimental stage.

The most prominent applications of AI

AI is transforming various industries, some of which are outlined below.

1. **Manufacturing:** Robots and intelligent systems enhance manufacturing efficiency and minimize errors. In automotive production, AI-powered robots handle tasks requiring precision, such as welding car frames and installing electronic components. These systems adapt to production changes and make real-time decisions using sensor data, increasing industrial flexibility and responsiveness. Their use reduces production time and improves quality control.

2. **Healthcare:** AI enhances disease diagnosis, guides treatment, predicts epidemics, and analyzes large medical datasets. AI has significantly advanced medical imaging analysis in healthcare diagnostics. For example, AI algorithms can examine X-rays, MRIs, and CT scans to identify early signs of diseases, such as cancer or cardiovascular conditions, with a high degree of accuracy. This technology accelerates diagnosis and detects subtle abnormalities that human radiologists might miss, potentially enabling earlier interventions and improving patient outcomes. In personalized medicine, ML algorithms assess genetic profiles, lifestyle factors, and medical history to recommend customized treatments. In oncology, AI systems such as IBM Watson for Oncology analyze extensive medical literature and patient data to offer evidence-based treatment recommendations for different cancers. They swiftly process and interpret complex genomic information, clinical trial results, and patient records, aiding oncologists in making informed, personalized treatment decisions.

3. **Smart cars:** AI can manage vehicles, automate driving, and enhance road safety and positioning.

4. **Commerce and marketing:** AI analyzes business data, enables targeted advertising, and enhances user experience on platforms such as Facebook. In commerce and marketing, AI algorithms predict consumer behavior and preferences, allowing businesses to offer personalized product recommendations and marketing strategies. AI's natural language processing capabilities enable sentiment analysis in social media monitoring, allowing businesses to gauge public opinion on their products or services in real time. For example, IBM Watson uses AI-driven sentiment analysis tools to assess customer feedback on social media, helping companies swiftly address emerging trends or issues.

5. **Text translation and processing:** AI tools such as Chat GPT and Google Translate can translate between multiple languages and analyze complex texts. Natural language processing in AI also enables the deployment of chatbots and virtual assistants, improving customer service across sectors.

6. **Gaming:** AI can create intelligent, competitive game characters that simulate human thought.

7. **Education:** AI is employed in education through adaptive learning platforms that tailor curricula to individual student performance and learning styles. For instance, Carnegie Learning's MATHia software uses AI to analyze student responses before offering customized math instruction by adjusting lesson difficulty and pace in real time for optimal learning outcomes.

8. **Economics and finance:** AI assists in analyzing financial data and predicting economic trends.

The role of interior design in improving the quality of the interior environment

Interior design merges artistic creativity with scientific principles to enhance indoor spaces in residential, commercial, and institutional buildings. It focuses on crafting appealing and functional interiors to meet individual needs and improve quality of life. Key elements include space planning, color schemes, furniture selection, lighting, material choices, and technology integration, all of which optimize functionality and aesthetics.

Interior design significantly enhances indoor environments by focusing on thermal comfort, indoor air quality (IAQ), and occupant well-being. This involves selecting materials and arranging spaces to maximize comfort and mitigate health risks from poor IAQ. Although the primary goal is to create visually appealing spaces, research shows that choosing appropriate materials and integrating indoor and outdoor areas can significantly reduce indoor air pollution [20]. Additionally, designing ventilation systems tailored to specific facilities, such as indoor swimming pools, is crucial for maintaining a healthy environment, as demonstrated by computational fluid dynamics simulations [21].

The primary objectives of interior design include enhancing visual appeal, improving functionality and usability, creating comfortable and inviting atmospheres, addressing the needs of occupants, maximizing the use of space, incorporating sustainable practices, and balancing form and function for optimal results.

Improving human comfort

Enhancing creativity and productivity

Since we spend the majority of our time indoors—whether at home, in the office, or in shops—it is essential that these environments be comfortable and functional. This requires providing appropriate furniture, selecting calming colors, and using suitable lighting tailored to the purpose of the space. For instance, ergonomic chairs and adjustable standing desks in an office can enhance comfort and productivity, while soft, neutral color schemes and adjustable LED lighting can create a soothing atmosphere conducive to focus and creativity.

This is accomplished by choosing colors with a view to their effect on human behavior and suit the purpose of the space, which helps stimulate creativity and boost productivity. Designer offices are carefully crafted to encourage creative thinking and enhance efficiency. Similarly, in educational environments like libraries or study rooms, designers often incorporate a mix of individual study areas and collaborative spaces, using warm wood tones and adjustable lighting to promote focus and intellectual exchange. Adding biophilic design elements, such as indoor plants or nature-themed artwork, further supports creativity and well-being for students and researchers.

Enhancing mood and health

Colors, design styles, and materials in interior spaces significantly influence mood and psychological behavior, promoting happiness and reducing stress, which in turn affects overall health. Much like a conductor orchestrating a symphony, interior designers carefully select elements to create a harmonious environment that impacts the emotions and well-being of the occupants. Each design element shapes a room's mood and atmosphere, influencing both the psychological and physical health of its inhabitants.

Achieving sustainability

Sustainable interior design can reduce resource consumption and the environmental impact of indoor spaces, reflecting a commitment to preserving the environment and promoting sustainability. For example, incorporating biophilic design elements, such as indoor plants or nature-inspired patterns, can create a calming atmosphere, reduce stress levels, and improve air quality, much like the tranquil effects of a serene garden or forest. This approach not only enhances occupants' well-being but also contributes to sustainability by fostering a connection between the indoor environment and nature.

Meeting special needs

Interior design can be tailored to meet the specific needs of individuals and communities. Spaces can be customized for the elderly, people with special needs, children, youth, men, and women. An example of this approach is the creation of a multigenerational living space that accommodates both elderly grandparents and young children. This might include features such as wider doorways and grab bars for the elderly, along with child-safe furniture and play areas for younger family members, all seamlessly integrated into a cohesive design that promotes interaction and shared experiences across generations.

Results

How AI can improve the quality of interior spaces

AI has become integrated into nearly every aspect of life, forming a core component of the technological systems that many fields rely on. The key applications of AI can be summarized as follows.

AI in media, financial transactions and marketing

Robots and AI-powered broadcasters perform human tasks across various non-media fields, such as collecting customer and company data, enhancing marketing campaigns, attracting potential customers,

and converting them into corporate clients. Additionally, they provide protection against theft and fraud through the use of electronic payment cards.

Figure 1. An Al Jazeera presenter interacts with an AI presenter and a robot during the Artificial Intelligence in Media 2023 conference.



Source: <https://www.aljazeera.net>

AI in healthcare

AI is improving administrative systems in hospitals. It streamlines tasks such as disease diagnosis, medicine production, and patient care, making healthcare more efficient and effective.

Figure 2. A doctor performs surgery with the help of a robot.



<https://www.tehrantimes.com> Source:

AI in education

The use of AI has contributed to the development of the educational sector in various fields by helping to communicate and access information easily and conveniently and by harnessing various tools that help in conducting various scientific models and experiments.

Figure 3. Enhancing learning by presenting scientific material using virtual reality (VR) glasses.



Source: <https://www.manhajiyat.com>

AI in interior design

AI is increasingly integrated into interior design, providing new tools for design education, improving the efficiency of layout planning, and optimizing design schemes. In interior design education, AI can help students visualize space by generating conceptual images. The effectiveness of these AI-generated concepts is not heavily influenced by the quality of the prompts provided [22]. AI also plays a role in creating interactive management systems for indoor layouts, enhancing work efficiency and personalizing designs to meet user needs [23]. Notably, AI is crucial in generating detailed and realistic 3D models for interior design, facilitating the modeling of object shapes and contours, which leads to more accurate visualizations and simulations. These applications highlight AI's transformative potential, from conceptual development to detailed spatial planning and visualization.

The integration of interior design and AI offers a promising future for advancing the design of interior spaces and significantly enhancing individuals' quality of life. These technologies contribute to creating smarter, more energy-efficient, safer, and more comfortable indoor environments. Key applications of AI in interior design can be identified in the following areas.

Using software and applications in 3D design

AI technology provides a range of design solutions and optimizes outcomes, such as organizing firefighting or drainage systems. By applying specific rules, AI analyzes optimal scenarios and reorganizes project tasks accordingly. Additionally, it identifies effective conflict resolutions, evaluates potential solutions, and makes data-driven decisions. AI also ensures compliance with established standards by assessing adherence to regulations.

A significant technological advancement in AI for interior design is the use of three-dimensional (3D) models to simulate reality. Simulation and modeling with computers aim to solve mathematical equations that govern design systems. AI begins by studying how humans store, process, and retrieve information, then translates these processes into computer programs for testing. This approach continually refines AI to function more like the human mind. In simulations, the computer is a tool for researchers, except when the governing equations are highly complex.

The use of AI in architecture begins with computers generating precise architectural plans and design concepts for furniture and interiors before implementation. This technology enables designers to create accurate 3D models, helping clients better understand the designs and make informed decisions. AI also allows real-time experimentation with colors, materials, and furniture arrangements, making it easy to modify designs according to customer preferences and project requirements using software such as

SketchUp, 3ds Max, and AutoCAD.

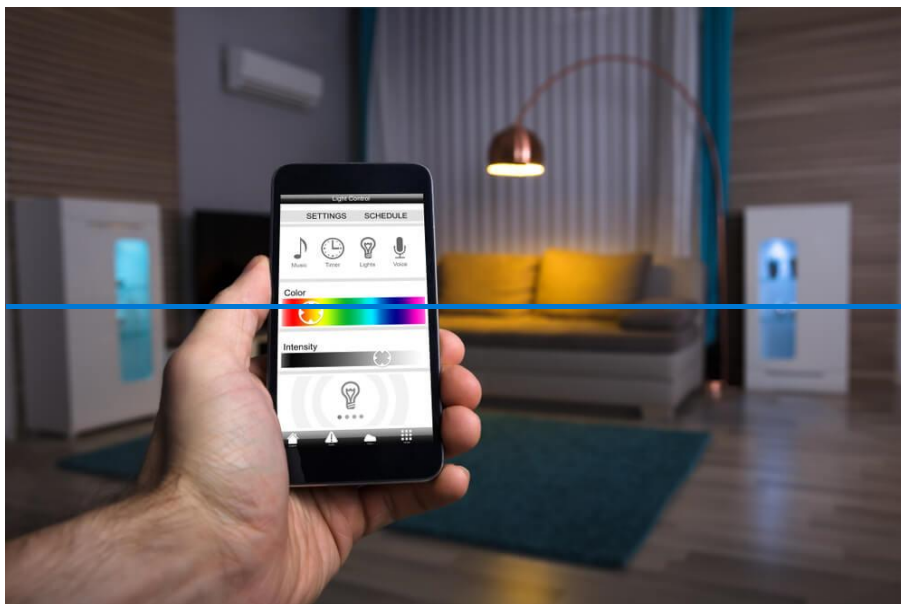
In the future, building design might become as simple as speaking into a smartphone using a voice assistant, such as Apple's Siri. For instance, a user could ask their phone to "design a five-story house in Le Corbusier's international style on a 200-square-meter plot." The computer would then produce detailed interior, architectural, structural, mechanical, and electrical designs with eco-friendly features.

Interestingly, the use of CAD software extends beyond traditional design applications. For example, specialized modules such as CANALIS in URBANO software are designed for wastewater system planning, highlighting the software's adaptability to niche engineering fields [24]. Moreover, the integration of VR technology into CAD software is an emerging trend, offering users a more immersive and interactive design experience [25]. Additionally, CAD applications are being developed for pharmaceutical drug formulations, further demonstrating the software's versatility in simulating and modeling complex systems [26].

Smart homes

Sustainable smart home interior design focuses on both the aesthetic and functional aspects of spaces, utilizing AI to optimize indoor environments. This includes smart systems like remote-controlled heating, movement detection, and automated lighting and cooling, which adjust air conditioning based on the needs of the space and the preferences of its residents. For example, automated natural lighting and temperature adjustments reduce energy consumption and costs, contributing to a more efficient, eco-friendly environment. Known as smart lighting, this system allows independent control of lighting in different areas, with customizable brightness and color to create the desired ambiance and enhance the overall interior design.

Figure 4. Controlling interior space lighting using AI.



Source: <https://ar.arenco.com.sa>

In addition to controlling surveillance devices, smart surveillance cameras can allow facial recognition with very high accuracy, using night vision. In addition, smart systems can use a variety of sensors to detect incidents such as leaks or fires and alert occupants immediately. This functionality has become available to users, who can tweak these increasingly complex systems in accordance with their needs through smart devices. Smart home systems allow users to open and close doors, control windows and pumps, switch cooling and heating devices off and on, adjust temperature, and so on. This functionality contributes to the sustainability of indoor spaces. Choosing eco-friendly materials and smart designs that minimize resource and energy consumption helps reduce the environmental impact of interior spaces.

Figure 5. Controlling windows, doors, and cameras using AI.



Source: <https://ar.arenco.com.sa>

Voice-controlled smart devices

It is now easy to control and interact with most electrical and electronic home appliances through voice commands, which can be linked to voice assistants such as Google Assistant, Siri, Alexa, and Bixby. These systems allow users to manage devices and meet their needs, such as controlling lighting, music, and security systems, making everyday life more convenient.

Figure 6. Examples of devices allowing for control of the home environment using voice commands and AI.



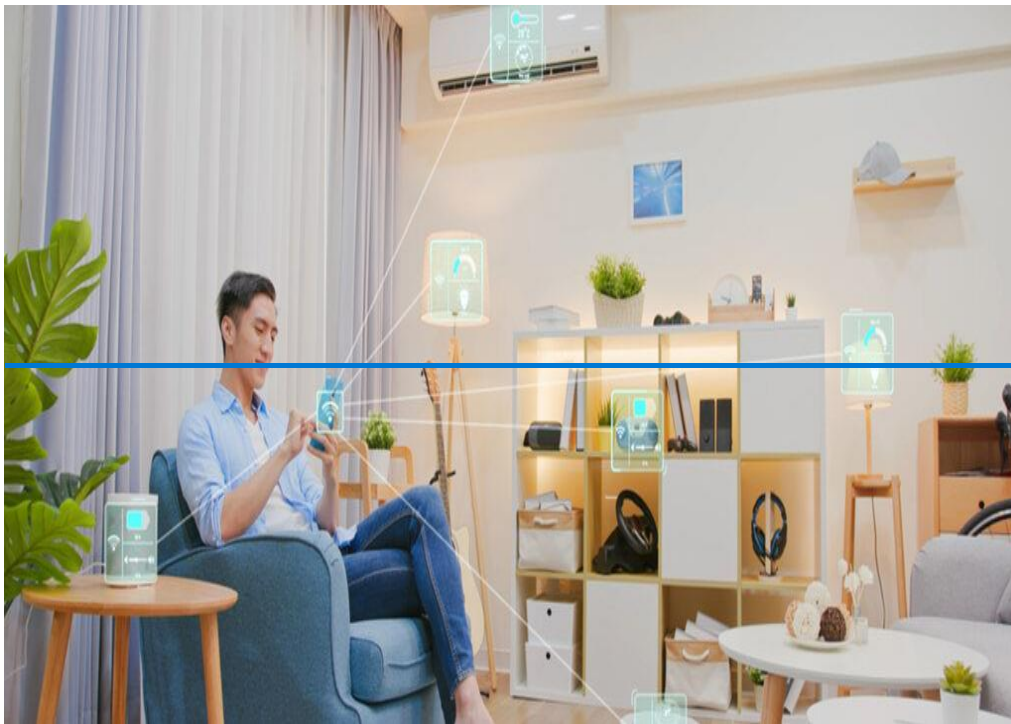
Source: <https://ar.arenco.com.sa>

Smart robotic assistants

Smart robots can significantly reduce time and effort in various tasks. For instance, robotic systems like the Roomba can automatically clean homes and offices, allowing individuals to make better use of their time. The potential of intelligent robotic assistants to improve comfort and luxury in different environments is increasingly recognized. Kumar et al. (2015) demonstrated this by developing a voice-controlled robotic assistant capable of moving objects, enhancing home comfort. Keates and Kyberd (2017) emphasized the importance of inclusive design to ensure that these benefits are accessible to a broader population. Singhal and Sille (2022) explored the role of robots in intelligent manufacturing, indirectly contributing to comfort by optimizing production processes and reducing labor-intensive tasks.

Notably, although these studies primarily focused on the practical aspects of robotic assistants, they implicitly recognized that the ease and efficiency provided by such technology can be considered a form of contemporary luxury. This is especially relevant in healthcare, where robotic devices designed for rehabilitation and assistance, as shown by Aufrichtig (2022) and Gonzalez et al. (2021), enhance the quality of life and autonomy for individuals with disabilities.

Figure 7. Illustration of the smart home and connected devices for controlling the interior space through AI.

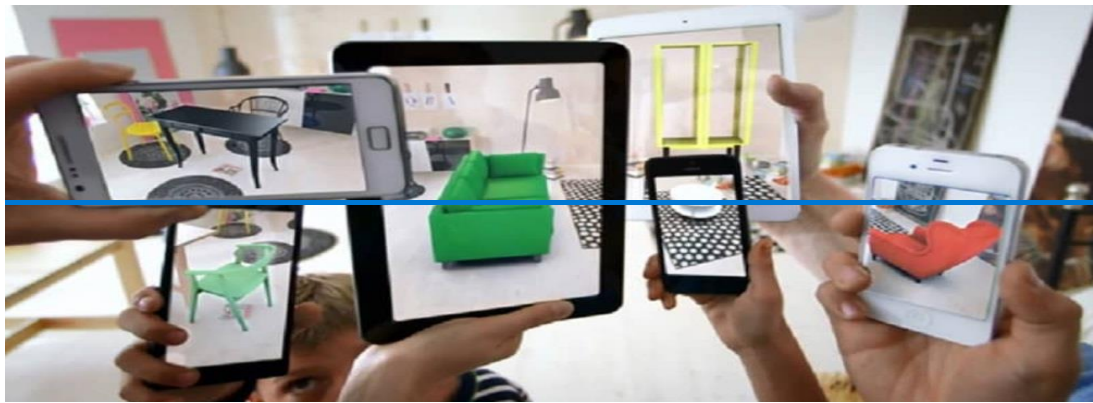


Source: <https://www.bayut.com>

Augmented reality

Augmented Reality (AR) technology has transformed interior design, particularly in terms of furniture selection and placement. AR applications allow users to preview furniture in their living spaces before purchase, improving decision-making (– et al. 2023; P et al. 2024). Developed on platforms such as Unity 3D, these applications replace traditional methods of measuring and visualizing spaces. Using a smart device, users can select furniture from a database and virtually place it in their rooms [27]. In addition to visualization, some applications offer features such as obstacle detection and optimal arrangement suggestions, enhancing the user experience. AR has also been integrated into educational interior design projects, highlighting its broader potential [28].

Figure 8. Using AR in interior design.



Source: <https://hbrarabic.com>

4. Discussion

Reducing the negative impact of materials on the environment

Achieving sustainability and preserving the environment are critical in today's world. It is essential to adopt sustainable practices in all aspects of life, particularly in interior spaces, to reduce environmental impact while meeting our needs. This involves improving resource efficiency, optimizing usage, enhancing air quality, managing waste, and using sustainable, environmentally friendly materials. Integrating interior design with AI can help achieve these goals.

Improving resource use for sustainability

Reducing resource use by conserving energy and water while using environmentally friendly materials enhances the efficiency and quality of interior spaces. AI systems can adjust lighting, heating, and cooling based on individual needs and the desired atmosphere, significantly reducing resource consumption.

The integration of interior design and AI promotes the use of sustainable, environmentally friendly materials in interior spaces. This approach supports sustainability goals and reduces the environmental impact of the construction and design industries.

Improving air quality and indoor environments

Smart systems and sensors embedded in heating and cooling devices can measure dust, odors, and harmful gas levels in indoor spaces. These systems automatically adjust to improve air quality and adapt to the user's needs, enhancing IAQ and comfort.

Figure 7. Controlling air conditioning and ventilation in interior spaces through AI.



Source: <https://ar.arenco.com.sa>

Reducing resource waste

One of the primary goals of AI in interior spaces is to adapt the environment to the user's preferences and needs, promoting sustainability and minimizing resource waste. For example, modern cooling devices equipped with inverter technology and various sensors can measure humidity and temperature levels. These systems simulate the user's lifestyle within the space, allowing for precise adjustments without the need for trial and error. Industrial heating devices similarly respond to users' needs, eliminating the need to manually turn off cooling equipment to save energy. Sensors automatically monitor the indoor environment and make real-time decisions to reduce the energy required to operate cooling devices, adjusting usage based on the area of the space and the working hours of its occupants. This optimization significantly reduces electrical energy consumption compared to traditional methods that do not rely on AI.

Figure 7. Controlling home appliances in the interior space using AI.



Source: <https://ar.arenco.com.sa>

Challenges that limit the use of AI applications in the design of interior spaces

The application of AI marks a revolutionary development in interior design, representing a positive shift in the optimal use of interior spaces. It enhances the balance between technology and respect for cultural and social values, further improving quality of life. This integration makes AI one of the most exciting advancements in both interior design and technology. However, the adoption of AI in interior design faces a number of challenges, which are detailed below.

Privacy and security

Although AI offers many advantages, such as tailoring locations to users' needs and facilitating access control and surveillance systems, the dependence of smart home systems on programming and advanced technology makes them vulnerable to exploitation by hackers.

Cost of AI infrastructure

The use of these technologies in internal spaces is costly, and their use is therefore limited to higher-income populations. The cost of adoption slows the spread of this technology.

Interaction with AI systems

Although the technology used in AI has advanced significantly, enhancing communication and interaction within indoor spaces, it cannot replace the role of social relationships or recreate the family atmosphere that emerges from human behaviors in these environments. Social dynamics are often variable and influenced by numerous social, psychological, and situational factors that AI is unable to comprehend or replicate. AI applications are rigid technological systems, lacking the human emotions and sensations that are intrinsic to us. Additionally, AI cannot produce art in the same way an artist does, even though both may draw from similar sources of inspiration.

5. Conclusions

This study demonstrates that implementing AI technologies in interior environments enhances ecological efficiency and optimizes the use of resources such as electricity and water, thereby reducing buildings' environmental impact and supporting sustainability efforts. AI-powered surveillance systems provide advanced monitoring and security features, improving access control and fostering a heightened sense of safety and comfort among occupants. A key benefit of integrating AI applications is the increased efficiency and productivity of indoor spaces, as well as the conservation of time and effort for users through automated and intelligent system management.

The deployment and configuration of AI systems in interior spaces create employment opportunities for skilled specialists and technicians, opening new career paths. The adoption of AI applications in interior design is becoming a priority in future projects across various functional areas. Enhancing education and training through targeted programs is essential for professionals to acquire the skills needed for successful project implementation. Promoting scientific research and innovation in AI is critical for exploring integration opportunities and developing new technologies tailored to the needs of indoor space users. Interior designers must collaborate with community members to ensure that design processes align with local cultural and social values. In addition, promoting the use of AI applications in cladding processes is vital for achieving higher levels of sophistication in interior design.

In conclusion, the literature highlights the importance of promoting scientific research and innovation in AI, not only to harness its potential for advancing various fields but also to address the ethical, security, and governance challenges associated with its integration into our daily lives. The insights from the literature can guide stakeholders in creating environments conducive to sustainable growth and innovation, while also ensuring that AI technologies are leveraged responsibly.

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