



The Role of Artificial Intelligence in Designing More Modern Furniture Towards the Bauhaus Movement

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ABSTRACT

With the development of the economy and the tools of scientific and technological intelligence, Artificial Intelligence (AI) has emerged and entered the field of interior design of modern homes, including the design of home furniture. AI in the field of home furniture design provided many features which significantly helped in reducing the daily operating time and energy cost, as well as improving the quality of products. Hence this study aims to explore the role of Artificial Intelligence (AI) and its applications in achieving more modern and innovative furniture towards the Bauhaus. The study showed that AI plays a crucial role in transforming the furniture design industry in a more modern way, since AI applications introduced new horizons for designers and manufacturers to develop designs that are innovative, sustainable, and of high quality. Therefore, AI applications help in improving the design process, choosing optimal materials, and enhancing the comfort and sustainability of furniture, due to its ability to analyze big data and use advanced algorithms, providing designers with valuable information and directing them towards making better decisions. Consequently, the integration of human creativity with the power of calculation and analysis of AI opens wide horizons to design more modern, unique, and sustainable furniture.

Keywords:

Artificial Intelligence; Bauhaus; Furniture

Introduction: The great development of information technology and systems has contributed to the emergence of new types of computer technologies that aim to support various business activities and fields, and among these technologies is what is known as: "Artificial Intelligence (AI)". AI is the basis for the development of intelligent systems in many

fields, such as expert systems which provide advice in many areas of knowledge by using data to diagnose problems and suggest appropriate solutions. (Ziyara, 2019). This is done by relying on some programs specialized in performing activities and operations as an alternative to humans, and introducing

intelligent behavior of humans into the function of machines. (Li & Zheng, 2018).

One of the fields in which the use of AI has been introduced is the field of interior design and the manufacture of home furniture. (Lahlah, 2020). The use of AI applications in the field of furniture design would provide solutions to the problems that this field suffers from, such as: low production efficiency and accuracy, lack of ability to innovate, poor quality of products, and poor ability to manage costs. (Long et al., 2020). Moreover, AI applications provide more modern home furniture designs that meet customers' desires and aspirations, and thus achieve the required competitive advantage.

Therefore, the use of AI applications has spread and its popularity has increased in the field of designing and manufacturing home furniture due to the many advantages achieved by using these applications in this field, including: increasing the accuracy and quality of design, and the emergence of many modern applications that support interior designers and facilitate the task of designing home furniture in particular and interior design of homes in general. (Hamdi, 2022). Accordingly, this research paper aims to highlight the role of AI and its impact on the accuracy of home furniture design, and its role in choosing a set of unique ideas and innovations using one of the directions of contemporary design, which is: "Bauhaus style".

Research problem: The interior designer spends long hours at work to implement the required projects designs, as well as the time to search for previous relevant projects. In this context, AI is used as a modern technique of great importance to address these problems, as it provides the designer the necessary time and effort in this complex process. Thanks to its smart and tremendous capabilities, AI can study a large amount of data, which facilitates the process of searching and testing ideas with high efficiency. Furthermore, it allows the designer to handle, store, and process huge amounts of data without errors in task execution. However, the use of AI applications in interior design processes is still not widely implemented.

As such, the problem of the current research is to explore the benefits and capabilities offered by AI in designing more modern furniture towards the Bauhaus, and to highlight its role in improving and facilitating design processes. The importance of the research: The importance of the study from the scientific (theoretical) side is to explore the use of advanced technology, represented by AI, to improve furniture design and to make it more modern and innovative. AI is a promising innovative technology, and its use in furniture design can contribute to achieving competitive distinction by providing unique and innovative furniture, as many individuals and companies tend to use advanced technology in both their lives and workplaces. Therefore, the use of AI in furniture design becomes important to keep pace with these modern trends.

The importance of the study from the practical side is to direct designers and those interested in designing furniture on how to use AI to improve their design and achieve modern furniture.

Research objectives:

This study seeks to achieve the following goals:

1. Exploring the way furniture design can be developed using AI to make it more modern and developed.
2. Studying the Bauhaus style and its trend in interior design, and exploring how to direct it towards the use of AI to achieve more modern furniture.
3. Reviewing the techniques and tools available in the field of AI that can be applied in designing new furniture.

Research methodology: To achieving the goal of this study, the following approaches have been followed:

1. The analytical descriptive approach through studying and analyzing concepts and terminology related to AI and the Bauhaus, and describing and analyzing some furniture designs.
2. The historical approach to reviewing historical information that was recorded in the past period of the Bauhaus and AI to ensure their validity, and rephrase

them to come up with results in the study.

What is Artificial Intelligence (AI):

To determine what AI is, we should understand its concept by reviewing the most prominent definitions presented for this concept, and determining the researcher's opinion on them. Also, we should review the history of its origin and development, and we should focus on the most prominent characteristics of AI, as follows:

Defining AI: AI is one of the most important branches of computer science, and one of the most prominent foundations of the technology industry and its foundations in the current era through which special software can be found and designed that simulate the method of human intelligence, so that machines can perform some tasks instead of humans. (Zarrouqi and Faltah, 2020). AI is defined as: the ability of computers and digital systems to simulate the human ability to think and solve complex problems. (Ferreira et al, 2020).

AI is also that science that makes the machine behave in a way that mimics human intelligence through computer programs and applications developed. This makes machines think like a person through their capabilities to carry out different conclusions, the ability to learn from errors, and perform works and tasks quickly and effectively. (Abdul Samad and Ahmed, 2020).

From another point of view, AI is defined as the ability of a device to carry out activities that can only be expected to be carried out by the human brain. These activities include the ability to know and the ability to acquire knowledge. They also include: judgment, understanding relationships, producing original ideas. AI aims to create intelligent machines that can interact in ways similar to humans, and is therefore seen as a simulation of the human brain. (Khawalid and Bouzerb, 2020).

Based on what has been mentioned above, we see that all previous definitions agreed that AI is considered a simulation of intelligent human behavior in logical thinking and performing tasks. Therefore, AI can be defined as one of the computer applications concerned with how machines simulate intelligent human behavior,

by programming these machines in a way that is able to think in a way similar to the human brain, and therefore behave and perform tasks in a way similar to the way a human behaves and performs.

From the previous definitions, it is clear that AI is characterized by its ability to think and learn by analyzing huge amounts of data, and using it to complete tasks, make predictions, and identify patterns that may be difficult for humans to discover. (Najah, 2023). Consequently, AI is characterized by its ability to develop systems and applications that can act intelligently similarly to the way human beings think in areas such as: learning, lack of understanding. This provides various services to users, such as: education, guidance, and interaction.

History of the Emergence and Development of Artificial Intelligence:

Although AI technology is only sixty years old, it has strong roots in several fields, including: mathematics, computer science, philosophy, psychology, and linguistics. Some scientists believe that the beginnings of the emergence of AI date back to the Second World War, where computer science researcher Alan Turing decoded the Enigma machine to intercept Nazi communications.

This machine is an ideal model for an intelligent computer, and it contributed to the development of the theory of Automata, or what is known as: "The Theory of Self-Reproducing". (Arnold, 1999). Therefore, other researchers moved towards creating a machine capable of thinking in a similar way to humans.

The term "Artificial Intelligence" was first coined at the Dartmouth conference in 1956, and at the same time, the first generation of digital computers began to appear in university laboratories. (Alan and Randy, 1998).

In 1974, AI faced major challenges, which led to a decline in funding for exploratory research in this field due to constant pressure from Congress to fund more productive projects. The British and American governments have been forced to withdraw their funding from all exploratory research in the field of AI, causing the first apparent setback in the field. (Raqueeq, 2015).

However, AI research experienced a resurgence in the early 1980s, achieving notable commercial success with expert systems. Expert systems are AI programs that simulate knowledge and analytical skills of human experts. By 1985, AI profits exceeded \$1 billion in the market, prompting governments to refund research in this field. In the 1990s and early 2000s, AI achieved great success, which meant that AI tools and systems became commercially available in the 1980s. (Afifi, 2015).

Characteristics of Artificial Intelligence:

AI has a set of characteristics that distinguish it from other computer technologies, such as: symbolic representation, interpretative judgment, and simulation of human behavior, which we will explain as follows:

A. Symbolic Representation:

AI technology is generally characterized by its reliance on the use of non-digital symbols to create intelligence and learning capabilities in computer systems. AI technology tends to use symbols to analyze problems and provide appropriate solutions to them. (Saleh, 2009).

The representation of information through symbols using AI technology is close to the form of the individual’s representation of the information that he possesses in his daily life, and this characteristic enables programs to deal with knowledge naturally, which contributes to carrying out software processing based on estimations, (Qualitative Processing) instead of traditional digital treatment known in the field of computers. (Afifi, 2015).

B. Interpretive Judgment:

AI technology is characterized by the quality of the issues it deals with, as there is usually no known algorithmic solution to the problems it deals with. Therefore, it relies on the subject of interpretive judgment in choosing the appropriate solution methods through its ability to adapt and work proactively while maintaining

the possibility of changing to other methods of solution. (Ilkka, 2018).

As long as there is no algorithmic solution to the problems addressed by AI, this technology resorts to non-systematic methods in choosing one of the solution methods that seems appropriate while at the same time remaining the opportunity to change to another method that is more appropriate and leads to the proper solution to the problem at hand at the right time. (Al-Rubaie, Al-Shammari, Al-Taie, 2013).

C. Simulation of Human Behavior:

AI technology is characterized by its ability to simulate human behavior and understand its nature regarding: thinking, performing tasks, and solving problems that challenge solutions using traditional computational techniques in a simplified manner by creating computer programs capable of simulating intelligent human behavior. (Abdul Samad and Ahmed, 2020).

Programs used in Artificial Intelligence:

There are many programs and applications used in AI, perhaps the most prominent of which are the Midjourney and the ChatGPT programs, which will be discussed as follows:

A. Midjourney:

“Midjourney” is an AI service that converts text into images. The program is distinguished by its ability to transform any written text into images with speed, ease, and high accuracy by enabling users to create images based on textual descriptions, and providing a wide range of art forms ranging from realistic patterns to abstract patterns. (Hanna, 2023). Midjourney was founded by David Holz, who is also a co-founder of LeapMotion, a well-known virtual reality company that was acquired by UltraHaptics in 2019 (Salkowitz, 2023). The "Midjourney" program offers (7) features for converting any text into images with different features, which are shown in the following table (Armetrics, 2023):

1- High Quality Image:	Producing a realistic image that competes with other AI programs.
2- High Resolution Image:	Images are created with a resolution of 1,792 x 1,024 pixels.
3- Freemium	It offers a limited number of free images before choosing

Model:	the paid plan, and the plan offers more features.
4- An Easy-to-Use Platform:	MidJourney is used by the Discord platform.
5- Customization:	MidJourney provides a set of different commands that help users fine-tune their creativity in images, giving them control over the final result.
6- Active Community:	Discord provides a group of active users where the user can share: his photos, thoughts, and questions to receive help from other active users.
7- Continuous Development:	MidJourney improves AI capabilities, ensuring the continuous development of the program.

B. ChatGPT:

ChatGPT, which is an abbreviation for "Chat Generative Pre-training Transformer", is defined as: a chatbot capable of: understanding questions, and answering them in natural language with unprecedented quality and in multiple languages. This application is based on AI techniques, and also uses GPT3 algorithms for automatic learning, which is provided with millions of texts and conversations available on the Internet, such as: newspaper articles, academic papers, blogs, film scripts, and television programs. The goal of this process is to make ChatGPT understand the meaning of words and phrases, and to produce responses that are relevant and appropriate to the context. (techpostoday, 2023). The ChatGPT application is a technology that relies on machine learning to produce written texts in a way that resembles texts produced by humans. This technology uses an algorithm called "Transformer", in which the model is trained on large amounts of texts related to various topics and in different languages, which enables it to understand natural language and produce written texts similar to those produced by humans. This technology is used in many applications, such as: chatbots, text production, machine translation, etc. (shadow, 2022).

ChatGPT is a pioneer in human conversation simulation, achieving exceptional accuracy in natural language generation (NLG) tasks.

This model that deals with all languages is developed naturally, founded in 2015 in the United States to enhance and develop AI systems to resemble human intelligence. This application is an important step in the development of automatic natural language processing algorithms.

The application was released at the end of November, and after about a week, on December 6, 2022, the producing company gathered more than a million users who tested the application and interacted with it, as they understood the diversity and complexity of the answers it provided. (techpostoday, 2023).

As for how ChatGPT works, it is as follows:

1. ChatGPT relies on deep learning technology and neural networks to understand natural language and generate texts automatically. It is trained on a wide range of tasks and texts, enabling it to: understand language, translate texts, and answer questions with high accuracy.
2. ChatGPT is trained on millions of texts and data from various sources, such as books, articles, and websites. It is constantly updated and improved by adding more texts and developing machine learning techniques used in it.
3. Thanks to these capabilities, ChatGPT provides accurate and useful answers to users, whether it is solving problems and questions or translating texts

between different languages, and works to meet users' needs comprehensively and effectively.

The impact of Artificial Intelligence on Interior Design in General:

The interior design at the present time is characterized by its adoption of Artificial Intelligence (AI) and its great investment. In the coming years, it is expected that the field of interior design will witness more dependence on AI technology, and thus this development is an opportunity to achieve a revolution in the field of interior design and radically improving it.

AI is used in interior design in several ways. One of these ways is to create virtual designs, where designers can enter their ideas and preferences, and then receive suggestions and options for furniture, color schemes, and other elements. AI also provides the creation of 3D visualizations and floor plans, allowing customers to realistically preview their space before any actual work begins. In addition, AI is used to analyze customer data, as previous customer preferences and their purchase patterns are analyzed. Thanks to this analysis, designers can anticipate future patterns and products that will be common, and this analysis helps in making more accurate design decisions and creating spaces that meet the needs and preferences of customers. (Hunter, 2023).

AI allows customers to see how different colours, textures, and furniture will look in any project before they make any commitments, saving time and costs. Designers can make adjustments to virtual models without the need for actual models, which contributes to saving time and effort. Furthermore, designers can offer their plans for customers in advance and try them completely in an interactive way through Virtual Reality (VR) technology, giving them the opportunity to see a variety of furniture options in their own space by applying Augmented Reality (AR) technology. ((Interior design artificial intelligence and its amazing uses, 2023).

Therefore, it can be said that the impact of AI on interior design is represented by the following points:

1. Design quality through high accuracy pictures.
2. Low costs and work time.
3. The transparency offered to the customer during the process.
4. No need to spend extra money by customers and clients.
5. The creation of unique and attractive designs.

In the field of interior design, AI can be useful, but it should not replace human creativity, as designers must benefit from AI as a tool to enhance and improve their ideas, and not to rely on it completely in directing the design process.

It is important for designers to keep their unique signature and their own vision, and to use AI to improve and develop their concepts.

The perfect balance between human control and the use of technology contributes to maintaining originality and excellence in the final design. (Team, 2023).

The Role of Artificial Intelligence and its Impact on Furniture Design:

AI is one of the most important modern technologies that is witnessing amazing development in the current era. Furniture design is also one of the fields that is greatly affected by the progress of AI and its applications. Thanks to the unique capabilities of AI in machine learning and data analysis, significant improvements can also be achieved in the furniture design and development process.

There are many aspects that AI affects furniture design, for example: AI can analyze the needs of users and direct the design process to meet these needs effectively and accurately, and it can also provide new creative ideas and innovative designs for furniture, which contributes to making products more beautiful and unique. (Pro, 2022).

Thanks to AI technologies, furniture manufacturing and production processes can be improved.

AI enables intelligent control of processes and improves production efficiency and quality of products. AI can also be used to develop

interactive and adaptive furniture, giving users a unique and comfortable experience.

Understanding the role of AI in furniture design is important for designers and furniture makers, as they can leverage AI capabilities to improve design quality and better meet users' expectations and needs. With further developments in the field of AI, we expect to see further improvements and innovations in furniture design, which enhances the user experience and contributes to achieving innovative and effective designs. (Pro, 2022).

It is believed that the first piece of furniture created using AI was the Kartell AI chair in February 2020, as the chair was designed in collaboration between designer Philippe Starck and Autodesk. Autodesk provides 3D design and manufacturing technologies, including in the field of architecture. AI did not replace the creative role of the designer, but rather calculated the optimal elements in terms of: quality, sustainability, and comfort, as the aesthetic sense of colors and shapes were left for the designer himself to decide.

The computer obtained information about the seat, backrest, and armrests of the famous Louis Ghost chair designed by Starck. In addition, materials used, weight, capacity, loading, and potential costs were calculated by the computer. Based on the different specifications, the program calculated possible designs.

In the end, Starck has chosen a lightweight chair that uses a lower amount of material and is fully made of recycled plastic. (Jordan, 2019).

It can be concluded that AI plays a crucial role in transforming the furniture design industry. AI technologies have ushered new horizons for designers and manufacturers to develop innovative, sustainable, high-quality designs.

AI helps in improving the design process, choosing optimal materials, and enhancing the comfort and sustainability of furniture.

Thanks to its ability to analyze big data and use advanced algorithms, AI can provide designers with valuable information, directing them towards making better decisions, and

integrating human creativity with the power of computation. AI analysis introduces wide horizons for designing sustainable, functional, and unique furniture in the modern era.

The role of AI is expected to continue to develop the furniture design industry, enhance user experiences, and meet their aspirations in the future.

With AI as a powerful tool, the furniture design industry can witness continuous progress, realizing new and sustainable creations that meet the needs and preferences of users in a rapidly changing world.

Artificial Intelligence Applications in the Bauhaus Style:

As we previously mentioned, AI is one of the most important technological developments that affect various fields, and one of these areas is the furniture design. In this context, AI uses methods inspired by the Bauhaus Design School.

The term (Bauhaus) refers to an art school that originated in Germany, and works to integrate craft and fine arts, including: drawing, painting, sculpture, and architecture. This school has a strong influence in the field of contemporary art schools, where the creativity of young artists combines design and handicrafts. The mastery of crafts by these young people is a service for the creativity process, and it attracts the teaching methods of fine arts. (Pevsner, 2007).

The Bauhaus School was established by the German architect Walter Gropius in 1919 AD in Weimar, Germany, after which its headquarters moved to Dessau in 1925 AD, and then to Berlin in 1932 AD. The school was closed by its president, Mies van der Rohe, in 1933, due to accusations that the Nazi regime promoted Globalism at the expense of German identity. Only a museum in Berlin remains, which aims to achieve beauty. One year after the war, Walter Gropius renamed the school "Bauhaus," and it restored hope and optimism to German society.

The Bauhaus School expresses its presence in German culture strongly through its exhibitions and theatrical and musical performances, and the school also faced

challenges from the conservative spirit in the bourgeoisie of Viber, as it was accused of spreading communist ideas. As a result, the school was transitioned to the industrial city of Dessau in 1925 AD; however, this transition presented an opportunity for Walter Gropius to build the school headquarters, its buildings, its equipment, and its furniture according to the Bauhaus ideas. (Attar, 1991).

The great importance of the Bauhaus is due to the combination of visual arts, architecture, and productive design into one unit. The Bauhaus was not just a new style in design, but rather a new way of life. In the field of furniture design, the Bauhaus focused on incorporating innovation in new forms and designs, learning modern techniques, and moving away from traditional decorations. It focused on functional and economic aspects, compatibility with modern homes, and suitability for urban spaces and modern residential buildings. It sought to achieve ease of care and waste optimization by designing lightweight and multi-functional furniture. (Khaled, 2009).

There is a lot of furniture made by Bauhaus designers and artists, the most important and famous of which are:

A. Wassily Chair:

The Wassily Chair is also designed as "Model B3 Chair" by the architect and modern furniture designer Marcel Breuer between 1925 AD and 1926 AD. Breuer inspired the idea of design of the chair while riding a bike, where he imagined that tubular steel could be used in the bike handles, and furniture could be made from it.

Breuer took the traditional shape of a chair and simplified it into a mere outer shell, with a seat, back, and arms made of leather and chrome. The chair was later called the "Wassily Chair" after the Russian painter Wassily Kandinsky, who was a friend of Breuer and a teacher at the Bauhaus school, and who praised the design when it was first produced.



Figure (1) Barcelona Chair



Figure (2) Tea Infuser

B. Barcelona Chair:

Barcelona Chair was designed in 1929 AD specifically for the Barcelona International Exhibition, and was made by the Art Director of the Bauhaus School, Ludwig Mies van der Rohe, in cooperation with the architect Lily Reish. The chair is characterized by having two thin rectangular pads on a light frame made of stainless steel. The initial design of the chair frame required fixing it with screws, but in 1950 AD (Incis, 2019).

It was redesigned using stainless steel, allowing the frame to be formed from a single solid piece of metal, and cowhide was used instead of the original ivory-coloured pigskin. (Wang, 2013).

C. Tea Infuser: In 1924, German artist Mariana Brandt transformed the traditional teapot design into something completely different. She stripped it of any decoration and made a metal geometric tea strainer. The tea infuser is only seven centimeters high, so its function is specific. Unlike traditional teapots, it is intended to extract tea concentrate that can be mixed with hot water in the cup to obtain tea. The infuser is characterized by its simple design and silver color, where the spherical body is supported by a transverse structure, and the ebony tea handle is placed in the shape of the letter (D) on the top part of the design for facilitate the process of pouring tea. (Davies, 2023).

D. Door Knob: This knob was designed by the German architect Walter Gropius, and was produced for the first time in 1923 AD after it was originally designed for the Fagus factory in the city of Alfeld in Germany. This knob is made of nickel-plated brass, and was produced by Easy Metal Hardware Company, characterized by its elegant industrial design. The knob consists of a thin cylindrical grip, as well as a folded and square shank. According to Easy, this knob is the most successful and most famous product that was produced by the Bauhaus School (Storer-Adam, 2014).



Figure (3) Door Knob

E. WA24 Lamp:

This table lamp was designed by Wilhelm Wagenfeld in 1924, and is commonly known as: “the Bauhaus Lamp.” Wagenfeld was 24 years old when he was accepted as an apprentice maker in the workshop of the Bauhaus in Weimar, and there he designed the first model of this lamp as a solution for a challenge given to him by László Moholy-Nagy. Later on, the Bauhaus designs were intended to be industrial products, and so they were made as such. Indeed, they were made by hand. Even today, the Wagenfeld WA 24 Lamp continues to be produced by hand, according to the original specifications of dimensions and materials. All lamps have serial numbers under the base, as well as the Bauhaus logos. As its name: “The Bauhaus Lamp” attests, the Wagenfeld lamp is a masterpiece that embodies the Bauhaus philosophy and dedication to Bauhaus design. The metal and glass lamp features circular, cylindrical, and spherical shapes. (TECNOLUMEN, 2023).

F. Nesting Table:

German-American artist Josef Albers designed this set of modern decorative tables while he served as the Art Director of the Bauhaus furniture workshop from 1926 to 1927 AD.

Each table was made from solid oak and coated acrylic glass.

Known for his colorful geometric works, Albers applied the same style to the tables, giving each one a distinct color of blue, red, yellow, and white. Also, he made them as overlapping tables to save space. (collection, 2023).



Figure (4) WA24 Lamp



Figure (5) Nesting Table

G. Baby Cradle:

Designed by Peter Keeler in 1922 AD, the cradle consists of simple geometric shapes, such as triangles and rectangles, and is characterized by its primary colors consisting of red and yellow.

It features a color block structure design, where red and yellow are used harmoniously; the cradle also features a blue circular rocker, an element that is a trademark of the Bauhaus school. (Hitti, 2023).

Nowadays, AI is used in furniture design applications to achieve the principles of Bauhaus in innovative and sustainable ways; AI also helps in analyzing the huge data and information related to the preferences of users and current trends in design.

With its advanced algorithms, AI can guide designers towards making more accurate and innovative furniture design decisions. Using Bauhaus methods and AI, designers may be able to create unique and functional furniture pieces that meet the aspirations of users and achieve the ideal balance between quality, beauty, and sustainability. AI would improve the design process, determine the



Figure (6) Baby Cradle

optimal materials, and provide a unique and integrated user experience.

Conclusion:

AI applications in the Bauhaus style represent an exciting transformation in the field of furniture design that combines human creativity and the computational power of AI, as the latter plays a decisive role in achieving more modern and innovative furniture design towards Bauhaus.

By analyzing big data and using advanced algorithms, AI can provide valuable insights to designers and guide them toward innovative and sustainable design decisions.

Bauhaus designs combine creativity, beauty, and function, and uses AI to achieve a balance between them. AI techniques can also improve the design process and guide current trends in the furniture design industry, which leads to the production of unique and functional furniture pieces that meet the aspirations of users by integrating human creativity with the computational power of AI. Also, more modern furniture models inspired by the Bauhaus and characterized by bold, aesthetic, and functional design can be achieved. It is expected that AI will continue to develop and contribute to the development of the furniture design industry and improve the user experience and innovation in the future.

Study Results:

1. AI enhances the ability of designers in general and furniture designers to use and analyze huge amounts of data, allowing them to create accurate designs according to specific methods, such as the Bauhaus, and thus reduces errors and repetitive work, and increase the speed of work.
2. AI algorithms contribute to analyzing customer behavior patterns and their preferences through available data, which enables them to produce unique and non-repetitive designs to meet the needs of each user in a special way.
3. The Bauhaus School is one of the most important schools that contributed to the analysis of the product and the dismantling of its basic elements, whether in terms of functionality or form.
4. The influence of the Bauhaus design philosophy on interior design and furniture design can be studied and creatively integrated into the current era. This opens the way to explore technology and AI as tools to develop furniture designs in modern and sustainable ways that combine traditional design heritage with technological innovation.

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