

Research Article

Application of Chinese Traditional Elements in Furniture Design Based on Wireless Communication and Artificial Intelligence Decision

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The traditional elements in Chinese classical furniture are constantly changing with the development of history and culture. It is not only quite artistic, but also has unique aesthetic value. Since the reform and opening up, Western culture has flocked into our country with the opening of the country, which has led to the blind pursuit of the aesthetic psychology of Europe and the United States, which is also more obvious in the furniture design. This kind of foreign-oriented mentality has caused my country's furniture design to stagnate or even regress in the display process of traditional cultural elements. The traditional elements contained in the furniture of people's homes turned out to be less, and some were even completely decorated in European and American styles. This tendency shows that the recognition of traditional elements in furniture design in our country is constantly decreasing, and we must pay more attention to it. In contemporary society, wireless communication and artificial intelligence decision-making have become an important reference for people to solve complex problems and have exerted more and more influence in all fields of social life. In the contemporary era when the global economy and culture are increasingly integrated, the daily life of people in various countries is inevitably affected. Furniture is a relatively important daily necessity in residents' homes. It has the closest contact with people's lives. It enhances the expression of traditional elements in furniture in China and wins the recognition of many people. It has a value that cannot be ignored for our work to promote traditional culture. In contemporary furniture style design, how to better integrate traditional cultural elements, so as to achieve the dual purpose of protecting cultural heritage and improving artistic quality and enriching the expression of traditional culture in contemporary furniture, has become a topic of concern to many people. The purpose of this research is to explore how to better integrate traditional elements into contemporary furniture under the background of contemporary technologies such as wireless communication and artificial intelligence decision-making. The study obtained the public's attitude towards the integration of traditional elements into furniture through questionnaires and judged how to innovate traditional elements through wireless communication and artificial intelligence decision-making, which would be more in line with the aesthetic concept of contemporary people.

1. Introduction

At this stage, research on the application of wireless communication and artificial intelligence decision-making in various industries has achieved considerable results [1]. In my country, new smart furniture products have been emerging in recent years. There are also numerous studies in this area. Taking ergonomics as the starting point, Liu Chen pointed out that this important discipline should be fully respected in furniture design and manufacturing, so that the designed

furniture is more livable. His research provides important ideas for the application of wireless communication and artificial intelligence decision-making in the field of home furnishing [2]. Yin Xiangying conducted research on the performance of Chinese traditional cultural elements in furniture, analyzed the main advantages and disadvantages in the design, and made some prospects for the future development trend. Cloud Satellite proposes to combine the innovation of traditional elements with the aesthetic trend of the public [3]. With the scientific combination of colors and

the flexible use of cultural spirit, we can design new Chinese furniture and promote the sustainable development of my country's furniture industry. Starting from the design and expression of Hakka cultural elements in contemporary homestay furniture [4]. Wen Shuting analyzed the contradiction between the strong regional characteristics of homestay buildings and the lack of characteristics of interior furniture design and proposed a scientific strategy to achieve the harmony and unity of the two sides [5].

The purpose of this research is to explore how to better integrate traditional elements into contemporary furniture under the background of contemporary technologies such as wireless communication and artificial intelligence decision-making. The study obtained the public's attitude towards the integration of traditional elements into furniture through questionnaires and judged how to innovate traditional elements through wireless communication and artificial intelligence decision-making, which would be more in line with the aesthetic concept of contemporary people. After analysis, this paper draws the following conclusions: first of all, it is necessary to enhance the propaganda, so that the people have more understanding of traditional culture, and change the blind worship of Western design [6]. The second is to be innovative and explore the ways and means of integrating traditional cultural elements into contemporary furniture. The third is to change the concept, combine traditional culture with contemporary furniture manufacturing, and achieve breakthroughs in manufacturing technology and other fields, so that it can truly enter the daily life of the people [7].

2. The Characteristics and Algorithm Selection of Wireless Communication and Artificial Intelligence Decision-Making

2.1. The Characteristics of Wireless Communication and Artificial Intelligence Decision-Making

2.1.1. Characteristics of Wireless Communication. At present, wireless communication has become the mainstream technology in the field of communication. Due to the acceleration of the deep integration of various fields of social life, the links between each other are becoming more frequent and random, and wireless communication, which can give full play to the immediacy of communication, is widely used [8, 9]. It uses electromagnetic waves for signal transmission, replacing the traditional cable and fiber transmission modes. Thus, a one-to-many mesh divergent signal sending and receiving system is formed. From the current point of view, the hardware foundation of wireless communication is mainly composed of signal transmitter, receiver, and transcoder. Among them, the transcoder is at the core position, and the sending and receiving of signals must be completed through it. Compared with the traditional transmission method using hardware as the medium, wireless transmission has certain shortcomings in terms of transmission distance and effect. However, for these shortcomings, signal transfer and enhancement can be carried out by building multiple base stations [10–12] (Figure 1).

2.1.2. The Characteristics of Artificial Intelligence Decision-Making. Artificial intelligence decision-making is a series of tasks that people enter a fixed program in an information terminal and let the latter complete information screening and automatic execution on their behalf. At this stage, the artificial intelligence strategy has penetrated into every corner of social life; from work to life, you can see its shadow almost everywhere. If it is further analyzed, artificial intelligence decision-making is to simulate human thinking process with information equipment, which has a high similarity with human cognitive process. The data generated by various human activities is increasing almost all the time, and the volume of data faced by various large-scale tasks is extremely large. The difficulty of screening and eliminating information has increased geometrically. Traditional manpower analysis has been difficult to maintain, and it is difficult to ensure high efficiency [13, 14]. Complete data analysis work and artificial intelligence decision-making can solve this problem well. Although the development time is still short, many major models of artificial intelligence decision-making have been derived. First of all is data mining and analysis. This is the most common and also the most basic mode. Through the analysis of existing data, information that can help make decisions is extracted. Next is natural speech processing. This model is more proactive, able to carry out work according to the unique characteristics of the object, and has been able to complete semiautomated work independently. The third is mesh search. This is an intelligent model developed in response to the inter-interlacing of various information at this stage [15–17]. It is mainly through pre-edited procedures to search for relevant content on the Internet, which is the basis for the work of various search engines. Fourth is deep learning. It is a higher stage of the development of artificial intelligence. An algorithm created by using bionics to study the structure of human neuron cells. Compared with other modes, it has more levels, so the performance is more specific, and the training difficulty is more controllable. It plays an important role in promoting the development of the contemporary "AI+" system (Figure 2).

2.2. Algorithm Selection. In contemporary society, a large amount of data occurs every day, resulting in the overall data volume maintaining a strong growth trend. Correspondingly, artificial intelligence-related algorithms and terminal equipment have also continued to achieve major breakthroughs. Combining wireless communication and artificial intelligence decision-making for case analysis requires not only historical data but also real-time attention to the generation and change of new data. In the last century, when information technology has not made breakthrough progress, the main way of data mining is to explore the laws contained in historical data and use it as a basis to judge future development trends. This model requires data evolution to always be in a relatively stable development curve [18]. This obviously cannot meet the needs of modern production and life for future development simulation, because in the information field with high incremental speed, the proportion of samples that can be referred to is too small to analyze the key

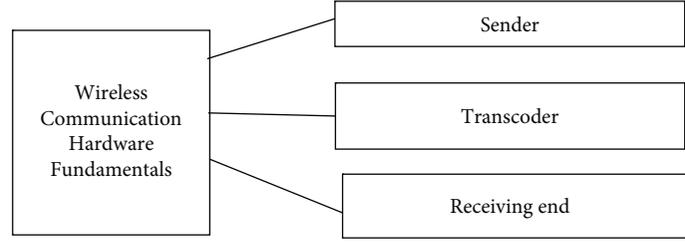


FIGURE 1: Characteristics of wireless communication.

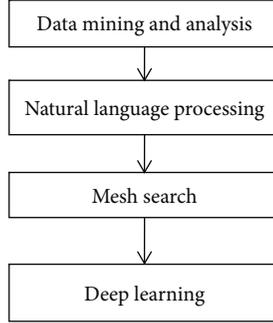


FIGURE 2: Characteristics of artificial intelligence decision-making.

to effectively grasp the existing problems. As a result, the clustering algorithm has attracted people's attention. Its advantages in three aspects are the main reasons why this research chooses to use this algorithm for simulation. The first is suitable for analyzing large increments of data, the second is the main characteristics that can effectively summarize the sample information, and the third is the distribution of scientific performance data categories [19, 20].

In this article, I select the BP-SVM model for research as

$$M(\xi) = T^w f(\xi), \quad (1)$$

$$M(\xi) = \sum_{i \in K} \beta_i f(\xi, \xi_i). \quad (2)$$

3. Research Design

3.1. Selection of Samples. This study conducted a questionnaire survey on a total of 520 customers from 15 furniture factories in Northeast my country with a registered capital of more than RMB 2 million and conducted random telephone interviews. The subjects of the telephone interview were randomly selected by the computer. The design of the questionnaire was strongly supported by all the research colleagues of the subject. Experts were invited to modify the questionnaire and conducted multiple rounds of small-scale tests, so that the data obtained from the questionnaire can really help the further development of the research. The questionnaire is anonymous, and the form of distribution is a combination of online transmission and mailbox delivery. A total of 520 questionnaires were distributed, and 491 were recovered. After horizontal comparison, the questionnaires with obvious loopholes were removed, leav-

TABLE 1: Sample coverage ($n = 472$).

Province	Sample size	The proportion
Heilongjiang Province	120	25.42%
Jilin Province	139	29.45%
Liaoning Province	213	45.13%

ing 472 copies. After the variance experiment test, the reliability of the questionnaire meets the research standards, and the overall reliability value is up to standard, and the homology deviation ratio has no visible impact on the research results (Table 1).

3.2. Variable Measurement. The assignment of various variables in this study is determined through a very scientific calculation process, and collective discussions are conducted to find solutions based on the problems found in the calculations. In the calculation of indicator scores, this study uses four-level scoring to stratify the selection indicators, which more accurately reflects the impact of various indicators on the research. Specifically, there are 30 questions in this questionnaire. The two previous problems are to confirm the source and identity of the participants, that is, natural information. The subsequent questionnaire is divided into 5 parts. They are the sources of furniture design knowledge, the level of perception of traditional elements, the degree of satisfaction with existing furniture, the strength of willingness to combine traditional elements with home furniture, and the suggestions for future trends of the combination of the two sides (Table 2).

4. Results and Recommendations

4.1. Results

4.1.1. Willingness Survey and Reason Analysis. The deviation in the understanding of traditional elements is an important reason for the lack of expressiveness of traditional elements in the furniture field of our country. Many participants think that the performance of traditional elements in furniture is "rich and rich" and "thick and big," and some participants want to buy furniture with traditional elements, but most of the same types of furniture on the market is a "luxury," which is nearly double the price to ordinary types of furniture. Therefore, only some so-called "successful people" buy them to show their strength and status, while ordinary

TABLE 2: Type and number of questions in the questionnaire ($n = 30$).

Type of question	Number	The proportion
Natural information	4	13.33%
Source of knowledge about furniture design	5	16.67%
Cognitive level of traditional elements	6	20%
Satisfaction with existing furniture	5	16.67%
Intensity of willingness to combine traditional elements with master furniture	6	20%
Suggestions for the future trend	4	13.33%

TABLE 3: Survey of willingness to use traditional elements to decorate furniture ($n = 472$).

Type of willingness	Number of choices	Percentage
Willing to choose	258	54.66%
Unwilling to choose	115	24.36%
Need to consider	99	20.98%

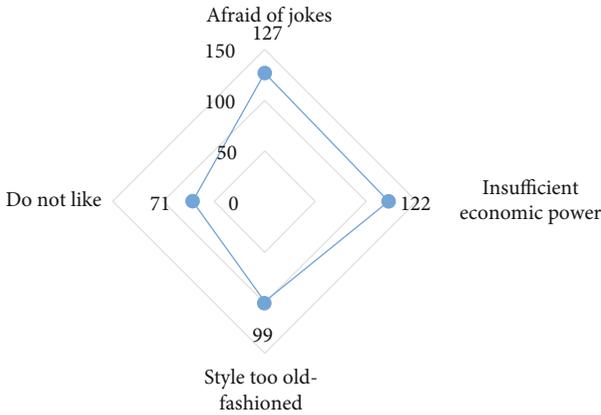


FIGURE 3: Reasons for not choosing traditional furniture.

families are due to their economic strength and floor space. Restricted by other factors, simple European-style furniture is often chosen for decoration (Table 3).

As shown in Table 3, in the 472 questionnaires, 258 people are “willing to choose” traditional elements, accounting for 54.66%, indicating that the popularity of traditional elements is very high. There are 115 people who are “unwilling to choose,” accounting for 24.36%. Through longitudinal comparison, the respondents of this part of the questionnaire are generally young. There are 99 people who “need to consider” in the selection, accounting for 20.98%.

In the 472 valid answer sheets, 53 of which “I like” and have been selected are removed, leaving 419 copies. It can be seen from Figure 3 that the top reason is “fear of people to make jokes,” and 127 people chose. Ranked second is “insufficient economic strength,” with 122 people choosing. Third and fourth places were “Taoty Style” and “I don’t like,” respectively, with 99 and 71 people selected.

4.1.2. Lack of In-depth Exploration of Traditional Elements. In interviews, I found that many designers simply pay atten-

tion to the pursuit of formal beauty when designing for clients, but they end up with the cultural connotation, not to mention the in-depth exploration of traditional cultural elements. This kind of pure commercialization model breaks the deep integration of traditional elements and modern furniture and makes furniture design present a situation of inconsistent development of form and connotation. This is very detrimental to the promotion of traditional Chinese culture through furniture design. To a large extent, the market competitiveness of traditional elements has been weakened.

4.2. Development Suggestions

4.2.1. Actively Seek Change, Endow Tradition with the Characteristics of the Times. After the data analysis of the furniture market in recent years, it can be found that the explosive models that have led the market trend in recent years have distinct characteristics of the times, which requires us to fully consider how to realize the traditional elements when promoting the combination of traditional elements and home furniture. Elements keep pace with the times. This kind of innovation should not only be reflected in the design concept, but also realize the contemporary expression of the pursuit of national culture and art. It should also be reflected in the material technology, weaken the heavy feeling of Chinese-style furniture, and give them a new form of expression with contemporary materials.

In this process, if it is difficult to obtain the user’s experience data based on the conceptual design of the product, and the product is produced for the user to improve the experience, it will cause great waste. At this time, it is possible to use the relevant programs of the computer to inductively analyze the preferences of certain types of customers in the data to determine which design can be more easily accepted by customers. And calculate the precise values of various aspects to reduce possible errors, so that the user is more convenient and comfortable when using the furniture.

4.2.2. Dig Deep into the Cultural Connotation behind Traditional Elements. In recent years, the Chinese government has vigorously promoted the recovery strategy of traditional culture, and various “foreign festivals” and cultural symbols have gradually disappeared from the people’s side. Our furniture design field should also actively follow this trend and make joint efforts in many aspects. The first is to promote the relevant departments of colleges and

universities to actively explore the increase of the proportion of traditional elements in teaching and to promote the theoretical development of traditional culture and furniture design. The second is to use platforms such as Douyin and Kuaishou to publish appreciation of traditional cultural elements to improve the cultural literacy of the whole people. Starting from the two most representative concepts of “object image” and “image” in Chinese culture, this paper analyzes the contemporary aesthetic embodiment of these two concepts and explores their specific application in modern furniture. From the example of the combination of traditional elements such as ink painting and traditional philosophy with modern furniture, she finally proposed that in order to achieve a perfect blend of traditional elements and modern furniture; it is necessary to dig deep into the aesthetic connotation behind traditional elements and abandon the superficial psychology of worshipping foreigners, to carry forward the beauty of our traditional culture.

5. Conclusion

Thousands of years of development and inheritance have allowed us to form a splendid traditional culture. It is the cultural self-confidence of the reemergence of the Chinese nation today and the spiritual symbol of the nation. In recent years, it has become a new fashion to integrate Chinese traditional cultural elements into furniture design. It has a very positive significance in enhancing cultural self-confidence and inheriting the essence of culture. At the same time, it also greatly enhances the expression of contemporary furniture, allowing people to have more choices in home decoration design. But at the same time, the mentality of quick success and the industrialized production of furniture also brought certain drawbacks, which are mainly manifested in the designer’s excessive pursuit of novel ideas and obscure image expressions, too much emphasis on the solemn and calm colors in traditional elements and neglected. The diversity of traditional elements has led to a large loss of youth groups. In today’s fierce conflict between multiculturalism, we must strengthen our adherence and innovation to traditional culture in order to better enhance cultural self-confidence. Both designers and consumers should pay attention to the learning and understanding of traditional elements. According to the data obtained from the questionnaire survey, the biggest problem in the process of combining traditional elements with contemporary furniture is the lack of innovation. Therefore, we should devote ourselves to exploring the ways of integrating the two from various aspects. Whether it is the form of expression or the production process, we must strive to combine the development trend of the same era, so that the traditional elements are accepted and loved by more people.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

It is declared by the author that this article is free of conflict of interest.

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References

- [1] H. M. Ziaul, D. Mariia, J. J. Veronica et al., “Wireless communication and artificial intelligence in the maritime industry: a bibliometric review and future research directions,” vol. 47, no. 5, pp. 577–597, 2020.
- [2] Q. Yang, “Traditional furniture elements in modern furniture design,” *Impression of Shenzhen*, vol. 584, no. 5, pp. 29–31, 2019.
- [3] Y. Dong, Y. Wu, and L. Y. Chen, “Analysis of the creative mode of applying traditional elements in modern furniture design,” *Architecture & Culture*, no. 2014-10, pp. 214–215, 2021.
- [4] X. H. Zhang, “Research on the application of traditional furniture elements in modern furniture design,” *Educational Theory Research (Ninth Series)*, 2019.
- [5] X. T. Yu, “The use of traditional cultural elements in modern furniture,” *Ju She*, no. 1, p. 1, 2020.
- [6] Y. J. Zhang, “What are the influences of the modern redesign and economy of the traditional elements of Ming-style furniture?,” *Marketing Circle*, vol. 26, pp. 117–119, 2019.
- [7] L. Liu, “The use of traditional furniture elements in modern furniture design,” *Forest Products Industry*, vol. 344, no. 12, pp. 120–122, 2020.
- [8] W. H. Lei, “Analysis of the application of traditional cultural elements in the design of new Chinese furniture,” *Art*, vol. 255, no. 3, pp. 87–87, 2020.
- [9] Y. Li, “On the effective application of traditional furniture elements in modern furniture design,” *Packaging World*, vol. 4, pp. 85–86, 2019.
- [10] H. F. Li, “Analysis of the individual elements in modern furniture design,” *Da Guan*, no. 3, pp. 82–83, 2019.
- [11] B. Li, J. Yang, Y. Yang, C. Li, and Y. Zhang, “Sign language/gesture recognition based on cumulative distribution density features using UWB radar,” *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1–13, 2021.
- [12] Z. Fang, J. Lu, F. Liu, J. Xuan, and G. Zhang, “Open set domain adaptation: theoretical bound and algorithm,” *IEEE transaction on neural networks and learning systems*, vol. 32, no. 10, pp. 4309–4322, 2021.
- [13] Y. X. Jiao, “Analysis on the application of Chinese traditional furniture elements in visual communication design,” *Business Stories*, 2019.
- [14] Z. G. Xiong, F. R. Mo, X. C. Zhao, F. Xu, X. Zhang, and Y. Wu, “Dynamic texture classification based on 3D ICA-learned filters and fisher vector encoding in big data environment,” *Journal of Signal Processing Systems*, 2022.

- [15] J. H. Wang, "Analysis on the Innovative Use of Traditional Elements in Graphic Design," *Art Science and Technology*, no. 5, p. 1, 2014.
- [16] J. Yang, H. Sun, D. Xu, and D. Yang, "Separation algorithm of interference signal in anonymous communication of ship wireless network," *Journal of Coastal Research*, vol. 103, no. -sp1, pp. 896-899, 2020.
- [17] M. Anand and M. Sundararajan, "Fractal antenna - wireless communication new beginning breakthrough in digital era," *Acta Informatica Malaysia*, vol. 4, no. 1, pp. 1-6, 2020.
- [18] P. F. Wu, "Talking about the application of Chinese traditional elements in the teaching of furniture design," *Ju She*, vol. 36, 2019.
- [19] W. Sun, "Research on the application of traditional furniture elements in modern furniture design," *Literature and Art Life--Wenhai Yiyuan*, no. 3, p. 159, 2020.
- [20] Y. H. Xiao, X. Mou, and X. X. Chen, "The application of fan elements in traditional furniture design," *Fujian Tea*, vol. 41, 210, no. 6, p. 85, 2019.