

## Personalized experience: The relationship between customer preference prediction and emotional satisfaction in homestay inn design

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**Abstract:** The improvement of people's living standards has led to changes in consumer attitudes, which have transformed customers' expectations of the lodging experience from a single functional demand to the pursuit of a personalized and emotional all-round experience. As an emerging form of accommodation, the personalization of its design and service has become a highlight to attract customers. This study adopts a mixed-method research design, combining qualitative interviews and quantitative questionnaires to comprehensively analyze the design preferences and emotional experiences of homestay inn customers. Not only that, this paper also develops a customer preference prediction model based on support vector machines and quantifies the relationship between design elements and emotional satisfaction through statistical analysis methods. The results of the study show that key elements in homestay inn design, including room layout, decorative style, and personalized service, are significantly and positively related to customers' emotional satisfaction. The highest Hamming loss of only 0.11, together with the high percentage of model stability, verifies the accuracy and reliability of the customer preference prediction model. The application of the emotional satisfaction scale reveals specific customer preferences for design elements, providing homestay inn operators with an empirical basis for optimizing design and service.

**Keywords:** Customer preference prediction, Emotional satisfaction, Homestay inn design, Personalized experience.

### 1. Introduction

As an emerging form of accommodation, homestay inn has become a popular choice for tourists in the tourism market. Personalized experience as a key factor for homestay inns to attract customers, its design and service innovation is directly related to customer satisfaction and loyalty.

This paper analyzes the impact of homestay inn design elements on customers' emotional satisfaction through the comprehensive use of qualitative and quantitative research methods, and constructs and validates a prediction model of customer preferences, which provides data support for personalized services in the homestay inn industry. In addition, this study explores how homestay inn design can enhance customers' emotional experience by meeting their personalized needs, providing a new perspective for the sustainable development of the homestay inn industry.

The first part of the paper is the introduction, which describes the background of the study, the purpose and problem of the study, as well as the theoretical and practical significance of the study; the second part of the paper is the related work, which reviews the relevant studies on customer preference prediction and emotional satisfaction, and provides the theoretical foundation for this study; the third section, method, describes the research design, data collection and analysis methods; the fourth section, results and discussion, demonstrates the performance of the customer preference prediction model and analyzes the relationship between design elements and emotional satisfaction; and the final section,

conclusion, summarizes the main findings of the study, discusses their practical significance for the bed and breakfast industry, and suggests directions for future research.

## 2. Related Work

In-depth analysis of customer preferences not only helps companies better position their products and services, but also provides guidance in product design, marketing strategy development, and customer relationship management. In order to analyze and predict the purchasing preferences of e-commerce enterprise customers and their corresponding product characteristics, Hui Wang combined K-means and Principal Component Analysis to generate corresponding and interpretable clusters of products and customers, and converted the original data into data that can be used for the training of preference prediction classifiers. The experimental results showed that 5 categories of product clusters and 11 categories of customer clusters were correctly generated based on the purchase data, and the prediction accuracy was improved, and the customer preference categories were predicted with 81.37% accuracy [1]. Shen Chao proposed a customer preference trend mining method in order to effectively obtain customers' demand preferences from online review data. The method adopts a time series model to predict the importance of product attributes in the next stage, and uses a decision tree model to analyze the trend of customer preferences, and classifies product attributes into key attributes and non-key attributes [2]. Based on the consumption preference and insurance demand characteristics of various types of customers, Zhu Linan proposed corresponding precise marketing strategies and customer maintenance strategies, which provided important references for the secondary precise marketing development and stable customer maintenance of CPS insurance for health insurance stock customers Zhu, et al. [3]. Zhu and Gou [4] used the Light Gradient Boosting Machine model and the Shapley Additive exPlanning method to empirically analyze the financial survey data in China from 2017 to 2019, fully exploring the influencing factors and mechanisms of residents' risk preferences based on high-dimensional features. The results showed that age, financial literacy, household income and intertemporal changes in income had significant effects, with age and financial literacy having the most important effects, and there was a negative relationship between age and residents' investment risk preferences Zhu and Gou [4]. Wu, et al. [5] took a specific customer as an example to show the whole process of matching customer preference with assembly decoration customization, and located the customer order separation point at the level of parts and components, which provided a reference for promoting the practice of assembly decoration projects, and at the same time, enhanced the competitiveness of developers and renovation companies, and maximized the customer satisfaction [5].

He P estimated a structural demand model on a network of stations to understand customer preference parameters based on the City of London's bike sharing system and used the estimated model to provide insights into the design and extension of the bike sharing system He, et al. [6]. Kuncoro and Kusumawati [7] emphasized the key role of customer preferences in the decision making process of purchasing a sleep product and provided marketers with suggestions for strategies based on customer preferences Kuncoro and Kusumawati [7]. Budur and Poturak [8] discussed customer perceptions of employee performance and the overall performance of employees in terms of customer satisfaction and loyalty based on the constant changes in customer preferences and behaviors Budur and Poturak [8]. Biswas, et al. [9] aimed to explore the relationship between destination attributes and tourist satisfaction and to what extent emotional involvement played a role in mediating the relationship between destination attributes and tourist satisfaction Biswas, et al. [9]. Dodanwala and Shrestha [10]

aimed to assess the mediating role of emotional exhaustion in the relationship between work-family conflict and job satisfaction among construction professionals [10]. Existing research has explored relatively little on the emotional dimension, especially on how to translate customer preferences into emotional satisfaction and personalized experiences. This study analyzes the personalized needs of homestay inn customers in terms of design and experience through a combination of qualitative and quantitative research methods, exploring how customer preferences affect their emotional responses and how homestay inn design can better satisfy these needs, thereby enhancing customer satisfaction and loyalty.

### 3. Method

#### 3.1. Research Design

The purpose of this study is to provide a comprehensive research framework, and put forward that personalized design can improve customers' emotional satisfaction with their homestay experience, and then affect the overall satisfaction and loyalty [11, 12]. The research framework includes identifying design element preferences, measuring emotional satisfaction, and the theoretical relationship between these conditions.

Based on the nature of research questions and data, this paper adopts a mixed method, which uses the interactive combination of qualitative and quantitative research. The qualitative part uses the method of generating data, including semi-structured interviews, participant observation and verbatim records, in order to obtain the description of customers' emotional response and personalized experience to the hotel design. In the quantitative part, data is collected through questionnaire survey, and the universality of qualitative findings is verified by statistical analysis, and the research hypothesis is tested.

This study deals with this problem from many favorable angles, not only through qualitative narration to show the data to understand the relationship between customer preference and emotional satisfaction, but also using digital quantification data.

#### 3.2. Data Collection

In this section, data are collected by exploring customers' accommodation preferences and emotional experiences [13, 14]. First of all, customers' preference information about personalized design is collected by questionnaire, including their expectations or satisfaction with room layout, decoration style and service experience. The questionnaire is composed of multi-angle questions, which is used to explain customers' evaluation of personalized service and investigate the influence of personalized service on their emotional experience. In addition, the internal experience of customers was interviewed. In order to understand the customer's preferences and the emotional experience of enjoying personalized service in the hotel, we conducted one-on-one semi-structured in-depth interviews with customers for further research. The results are shown in Table 1:

**Table 1.**  
Interview data.

Participant ID	Interview Date	Room Layout Preference	Decor Style Preference	Service Experience Expectation	Personalization Perception	Emotional Reaction
P001	2024-03-10	Modern	Minimalist	High	Positive	Satisfied
P002	2024-03-11	Traditional	Rustic	Medium	Neutral	Neutral
P003	2024-03-12	Contemporary	Eclectic	Low	Negative	Dissatisfied
P004	2024-03-13	Industrial	Modern Simplicity	High	Positive	Very Satisfied
P005	2024-03-14	Scandinavian	Cozy Comfort	Medium	Neutral	Satisfied
P006	2024-03-15	Japanese Zen	Simple and Natural	Low	Positive	Slightly Disappointed

Table 1 lists the preferences and emotional reactions of homestay inn customers in personalized experience, which not only reveals their real wishes and feelings, but also can be used as a direct reference for improving service and design of homestay inn. In addition, the observation method supplements the three data collection strategies by observing tourists' behaviors and nonverbal reactions in their natural environment. By directly observing the guests, we can get the real data related to their emotional state and preference satisfaction, and identify the subtle differences that guests may not express in questionnaires and interviews. Through three strategies, this paper constructs a multidimensional data set, and design feedback, emotional experience and behavioral response are all included in the data set. The data collection method described in this paper provides a variety of data, which provides a more comprehensive perspective for personalized experience and provides practical significance for optimizing its services and designing strategies.

### 3.3. Customer Preference Prediction Model Development

In the process of establishing customer preference prediction model, SVM can deal with different classification types and find the optimal hyperplane in the feature space as the classification function. SVM can handle more complex data sets and solve different characteristics when predicting customer preferences, such as customers' evaluation and preferences for facilities and opinions in user comments. SVM also solves the nonlinear problem by mapping the original data to the high-dimensional space in the feature map, and then calculating the optimal linear separation hyperplane. In this study, this paper uses a customer data set including reservation records, online reviews and rating information to train the SVM model. Before performing cross-validation and other techniques to evaluate SVM and obtain the best prediction ability about unknown data, the feature selection step is implemented to improve the performance of SVM. Finally, SVM classifies new customer data in real time, and predicts customers' interest and potential benefits in using facilities, thus guiding the decision of personalized service, which not only helps to improve customer satisfaction, but also helps to improve the market competitiveness of homestay [15].

### 3.4. Methods of Data Analysis

In this study, statistical analysis was applied to quantify the data and descriptive statistics provided a general understanding of customer preferences and satisfaction. Mean and standard deviation were used to describe the distribution of customer preferences for room layout:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i \quad (1)$$

$$\sigma = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2} \quad (2)$$

Where  $x_i$  is the preference score of the  $i$ th client and  $n$  is the total number of clients.

Further, t-test and ANOVA are used to explore whether there is a significant difference between different groups of customers. t-test formula is used to compare the difference in means between two groups:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_{\text{pooled}} \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad (3)$$

Where  $t$  refers to the statistic,  $\bar{x}_1$  and  $\bar{x}_2$  are the means of the two groups respectively,  $s_{\text{pooled}}$  is the combined standard deviation, and  $n_1$  and  $n_2$  are the sample sizes of the two groups.

Correlation analysis reveals the strength of association between different variables, using Pearson's correlation coefficient  $r$  to quantify the linear relationship between two variables:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}} \quad (4)$$

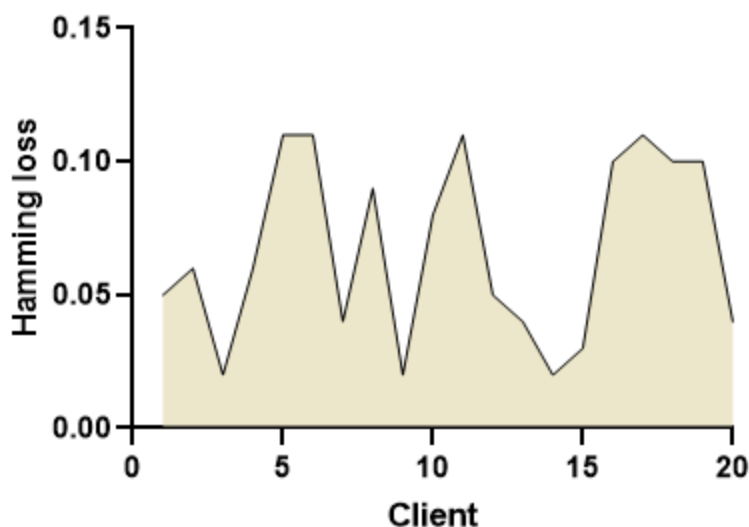
Where  $x_i$  and  $y_i$  are the observed values of the two variables, respectively, and  $\bar{x}$  and  $\bar{y}$  are their means.

Content analysis, as a qualitative research method, systematically sorts out open feedback from customers and identifies key themes and patterns in customer feedback. By carefully reviewing interview records and questionnaire responses, capturing the specific emotional reactions of customers towards the design elements of homestays and their views on personalized services. Topic analysis further deepens the findings of content analysis, identifying core themes in the data through coding and classification processes. These themes reflect various aspects of customer experience and how they comprehensively affect overall customer satisfaction.

## 4. Results and Discussion

### 4.1. Customer Preference Prediction

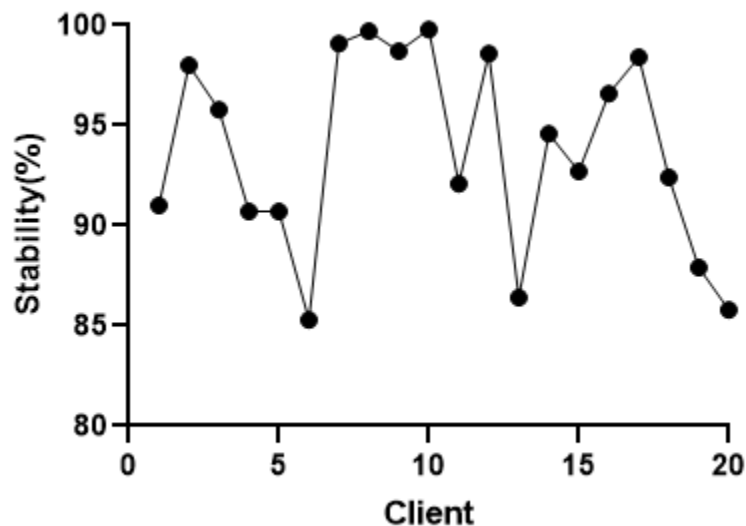
This paper constructs a customer preference prediction model in the previous text. In order to comprehensively evaluate the performance of the customer preference prediction model, Hamming Loss is used as an indicator to measure the accuracy of prediction. At the same time, the stability and coverage of the model are analyzed. The Hamming loss result is shown in Figure 1:



**Figure 1.**  
Hamming loss.

Analyzing the Hamming loss data in Figure 1, this paper found that the customer preference prediction model constructed had the highest Hamming loss of only 0.11, which was generally at a low level. This result means that among all predictions, only 11% of the highest predictions did not match the actual preferences of customers, indicating that the model can make correct predictions in most cases.

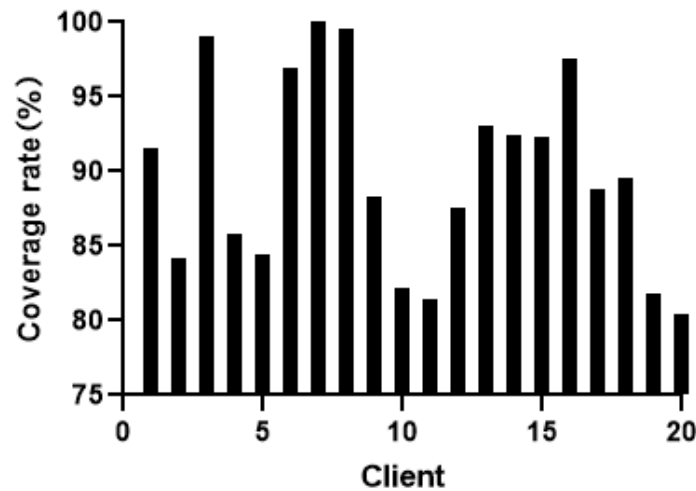
The stability results are shown in Figure 2:



**Figure 2.**  
Stability.

Analyzing Figure 2, this paper found that after multiple predictions, the predictive stability of the prediction model remained above 85.3%, reaching a maximum of 99.8%, indicating that the model can provide highly consistent prediction results in the vast majority of cases. This high level of stability results in high predictability of the model's performance at different time points and on different datasets, even in the face of small changes or fluctuations in the data.

The coverage results are shown in Figure 3:



**Figure 3.**  
Coverage.

Figure 3 reveals the coverage of the prediction model in customer preference prediction, with a maximum coverage of 100%. This comprehensive coverage means that the model can effectively capture the diverse needs of different customer groups, ensuring that each customer can obtain homestay design options that match their preferences. The advantage of high coverage is that it can significantly improve customer satisfaction and experience. When customers discover that the system can understand and meet their personalized needs, their overall impression and loyalty to homestays will also increase. In addition, comprehensive coverage also helps homestay operators to have a more comprehensive understanding of their customer base, thereby making more precise adjustments in service and product design.

#### 4.2. Evaluation Results of Emotional Satisfaction

In the study of personalized customer experience in homestay design, this study not only focuses on the impact of design elements on emotional satisfaction, but also measures these impacts through quantitative data collection and analysis. By constructing an emotional satisfaction measurement table, this study obtained key data points that revealed the satisfaction level of customers with various aspects of homestay design and how they comprehensively affected the overall emotional experience of customers, as shown in Table 2:

**Table 2.**  
Emotional satisfaction.

Customer ID	Room Layout Satisfaction	Decor Style Satisfaction	Color Matching Satisfaction	Personalized Service Satisfaction	Emotional Satisfaction Score
C001	8	7	9	10	8.6
C002	6	8	7	9	7.8
C003	9	6	8	7	7.4
C004	7	9	6	8	7.5
C005	5	7	8	10	7.7
C006	10	5	7	9	7.9
C007	8	10	7	6	7.8
C008	9	8	9	8	8.5

Table 2 records the satisfaction ratings of homestay customers for four key design elements: room layout, decoration style, color matching, and personalized service, and calculates the overall emotional satisfaction of each customer based on these ratings. The above data not only provides a window for homestay operators to gain insights into customer preferences and emotional experiences, but also provides an empirical basis for optimizing design and services, helping to improve customer satisfaction and enhance customer loyalty.

#### 4.3. Customer Preferences and Emotional Satisfaction

This paper explores how customer personalized preferences interact with the emotional satisfaction they experience in homestay accommodation, which is crucial for achieving personalized experiences in homestay design. Through correlation analysis, this study quantified the strength of the relationship between key design elements such as room layout, decorative style, color matching, and personalized services and customer emotional satisfaction, thereby clarifying which design features are key to enhancing customer emotional experience. The results are shown in Table 3:

**Table 3.**  
Correlation data.

Feature/Indicator	Room Layout	Decor Style	Color Matching	Personalized Service	Emotional Satisfaction
Room Layout	1.00	0.75	0.71	0.83	0.87
Decor Style	0.75	1.00	0.79	0.87	0.85
Color Matching	0.71	0.79	1.00	0.80	0.82
Personalized Service	0.83	0.87	0.80	1.00	0.92
Emotional Satisfaction	0.87	0.85	0.82	0.92	1.00

The rows and columns in Table 3 represent different elements of homestay design, including room layout, decorative style, color matching, and personalized services, which directly affect the customer's accommodation experience. The numerical range in a cell ranges from -1 to 1, with positive values indicating positive correlation, meaning that the improvement of one element is often accompanied by the improvement of another element.

The value on the diagonal is always 1 because each element has a completely consistent correlation with itself. By analyzing these correlation coefficients, this paper quantifies the specific impact of design elements on emotional satisfaction. The correlation coefficient between room layout and emotional



satisfaction is high, indicating that optimizing room layout will significantly improve the emotional experience of customers.

#### 4.4. Discussion

This paper provides profound insights into the homestay industry through empirical research, particularly in understanding the complex relationship between customer personalized preferences and emotional satisfaction. Through correlation analysis, this study finds that there is a significant relationship between the design elements of homestay inn (room layout, decoration style, color coordination and personalized service) and customers' emotional experience, so as to put forward data-based suggestions for homestay inn design and clarify the key design elements that can improve customers' emotional satisfaction. This study provides valuable insights and tools, but there are also problems of limited sample size, which may affect the universality and practicability of the research results.

In order to solve this limitation in future research, the sample size should be increased, which will better represent the research results. Moreover, most of this research focuses on the visual and sensory aspects of homestay inn design, and seldom pays attention to cultural or regional differences and other influencing factors, which is also a shortcoming that cannot be ignored.

## 5. Conclusion

This study analyzes the relationship between customer personalized preference and emotional satisfaction in hotel design, and on this basis, it provides empirical insights for the hotel industry by constructing a customer preference prediction model and quantifying emotional satisfaction. The study reveals the positive correlation between design elements such as room layout, decoration style and personalized service and customer emotional experience, and verifies the accuracy and reliability of the prediction model through the evaluation of Hamming loss and model stability.

Due to the limited sample size of this study, it may affect the universality of the results. In addition, research mainly focuses on visual and sensory design elements, with insufficient consideration of cultural and regional differences. Future research should expand the sample size and consider these factors to enhance the broad applicability of the study.

Technology will continue to advance with the development of the times, especially with the application of big data analysis and artificial intelligence. The homestay industry is expected to achieve more accurate customer preference prediction and more personalized service design. Meanwhile, the methodology of this study provides a framework for subsequent research and promotes further development in the field of customer preference and emotional satisfaction research.

### Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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## References

- [1] H. Wang and C. Li, "Product feature representation and customer preference prediction based on machine learning," *Computer Applications and Software*, vol. 39, no. 9, pp. 158-166, 2022.
- [2] S. Chao, A. Wang, X. Lu, Z. Peng, and Q. Zhang, "Customer preference trend mining based on online reviews," *Journal of Systems Engineering*, vol. 36, no. 3, pp. 289-301, 2021.
- [3] L. Zhu, J. Niu, and H. Qiao, "Research on precision marketing of China Post Insurance health insurance based on customer profile," *Postal Research*, vol. 40, no. 1, pp. 57-63, 2024.
- [4] Q. Zhu and X. Gou, "Empirical analysis of resident investment risk preference based on LightGBM and SHAP methods," *Financial Technology Era*, vol. 32, no. 4, pp. 79-84, 2024.
- [5] S. Wu, X. Zhang, and Y. Wu, "CODP point positioning for prefabricated decoration projects based on customer preferences," *Project Management Technology*, vol. 20, no. 3, pp. 101-105, 2022.
- [6] P. He, F. Zheng, E. Belavina, and K. Girotra, "Customer preference and station network in the London bike-share system," *Management Science*, vol. 67, no. 3, pp. 1392-1412, 2021. <https://doi.org/10.1287/mnsc.2020.3620>
- [7] H. Kuncoro and N. Kusumawati, "A study of customer preference, customer perceived value, sales promotion, and social media marketing towards purchase decision of sleeping product in Generation Z," *Advanced International Journal of Business, Entrepreneurship and Sme's*, vol. 3, no. 9, pp. 265-276, 2021. <https://doi.org/10.35631/AIJBS.39018>
- [8] T. Budur and M. Poturak, "Employee performance and customer loyalty: Mediation effect of customer satisfaction," *Middle East Journal of Management*, vol. 8, no. 5, pp. 453-474, 2021. <https://doi.org/10.1504/MEJM.2021.117510>
- [9] C. Biswas, S. K. Deb, A. A.-T. Hasan, and M. S. A. Khandakar, "Mediating effect of tourists' emotional involvement on the relationship between destination attributes and tourist satisfaction," *Journal of Hospitality and Tourism Insights*, vol. 4, no. 4, pp. 490-510, 2021. <https://doi.org/10.1108/JHTI-05-2020-0075>
- [10] T. C. Dodanwala and P. Shrestha, "Work-family conflict and job satisfaction among construction professionals: The mediating role of emotional exhaustion," *On the Horizon: The International Journal of Learning Futures*, vol. 29, no. 2, pp. 62-75, 2021. <https://doi.org/10.1108/OTH-11-2020-0042>
- [11] D. R. Patil and N. L. Rane, "Customer experience and satisfaction: Importance of customer reviews and customer value on buying preference," *International Research Journal of Modernization in Engineering Technology and Science*, vol. 5, no. 3, pp. 3437-3447, 2023.
- [12] J. Duan, "The application of architectural environment psychology in the space design of homestay," *International Core Journal of Engineering*, vol. 8, no. 5, pp. 283-288, 2022.
- [13] H. Zhenkai, P. Haowei, C. Hui, and G. Zoboki, "Design and development of smoke-free homestay inn in the post-pandemic Era," *Tobacco Regulatory Science*, vol. 7, no. 6, pp. 5330-5339, 2021. <https://doi.org/10.18001/TRS.7.6.23>
- [14] Z. Liu, J. He, and Y. Ren, "Analysis and design optimization strategy of indoor thermal comfort for different thermal experience groups of ethnic minority homestay-style renewal dwellings in northern Guangxi," *Academic Journal of Science and Technology*, vol. 3, no. 2, pp. 96-107, 2022. <https://doi.org/10.54097/ajst.v3i2.2100>
- [15] Y. Niu, C. M. Yee, and B. C. Yin-Fah, "Weight analysis of the influencing factors of homestay competitiveness in rural Guangzhou, China," *Journal of Architectural Research and Development*, vol. 7, no. 2, pp. 40-52, 2023. <https://doi.org/10.26689/jard.v7i2.4774>