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APPLICATION OF ARTIFICIAL INTELLIGENCE IN VISUAL COMMUNICATION OF GREEN URBAN RURAL INTEGRATION LANDSCAPE DESIGN

Abstract: In recent years, with the rapid development of the economy and the acceleration of urbanisation, urban construction, and rural construction have achieved a positive interaction, and the landscape development resources and development needs of urban and rural areas have also been constantly gathered and integrated, and gradually formed a unique urban-rural integration landscape style. However, the inherent contradictions in urban and rural development are still difficult to alleviate fully and have caused serious obstacles to the visual transmission of urban-rural integration landscape style. There are differences in culture, economy, and lifestyle between urban and rural areas, and the current landscape design approach finds it difficult to find an effective balance between preserving and promoting traditional rural culture and meeting the living needs of modern urbanites. To solve this problem and improve the visual communication effect of urban-rural integration landscape style, based on the analysis of the definition, constituent elements, and visual communication requirements of urban-rural integration landscape style, combined with Artificial Intelligence (AI) technology, this paper has conducted in-depth research on the visual communication of reuse design and green environment-friendly urban-rural integration landscape style. The experiments were carried out from three dimensions: feature extraction, visual communication effect, and environmental and economic benefit coefficient. The results showed that in terms of visual communication effectiveness, compared to traditional models, AI-based integrated urban and rural landscape visual communication had an average score of 0.77 and 0.70 points higher in terms of aesthetics and harmony, respectively. From the specific numerical results, it can be seen that the method in this paper can effectively improve the visual communication effect of reuse design and green environmental protection urban and rural integration landscape style, and promote the healthy development of urban integration landscape.

Keywords: visual communication, artificial intelligence, urban-rural integration landscape, reuse design, green and environmental protection

Introduction

With the continuous popularisation of the concept of sustainability and the constant growth of the socio-economic level, information technology and transportation networks have made considerable progress. The spatial boundary between urban and rural areas is becoming more and more blurred, and the development of visual communication of urban-rural integration landscape style has become an inevitable trend to improve the overall image and cultural value of each region. However, the current urban and rural landscape planning in most areas remains at the level of material form planning, ignoring the natural environmental functions of urban and rural areas. Traditional manual planning

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also difficult to present a good visual transmission effect, which has a serious impact on urban-rural integration and economic integration. With the continuous maturity of intelligent technology, artificial intelligence technology has made considerable progress and has been widely used in various professional fields. Artificial intelligence can extract hidden patterns and trends from big data, enabling analysis and understanding of a large amount of visual data; Visual communication is mainly expressed through visual elements such as images and charts, which are intuitive and easy to understand. It has broad application prospects in advertising and marketing, education and training, media, and other fields. In the visual transmission of urban-rural integration landscape, AI technology can effectively use natural and human resources to achieve good reuse design and green environmental development of urban and rural economies while pursuing functional efficiency.

Related work

In recent years, the increasingly prominent environmental problems and contradictions have made reuse design and visual transmission of green and environment-friendly urban-rural integration landscape style become the focus of many scholars. Yang [1] believed that the rapid expansion of urban space has accelerated the mutual evolution of landscape types. He designed a hybrid cellular automata model to simulate the dynamic changes of urban-rural landscapes, revealing its visual transmission driving mechanism. Finally, the simulation of the landscape state showed that the proposed model has a certain effect on promoting the reuse design of urban land resources and the development of urban-rural green environmental protection. Gungor and Ahmet [2] believed that the current visual quality of urban and rural landscapes needs to be improved, and through research, it was found that the urban-rural integration landscape has a wide range of features such as naturalness, diversity, and vividness and that the proportion of water surface, the balance of water elements of plant materials, and the number of auxiliary elements can play a positive role in the visual transmission quality of the landscape. Kaminski [3] proposed a visual communication method of landscape style based on urban-rural gradient, which integrated multiple landscape pattern indicators related to urban and rural natural resources and important ecosystems, and helped local decision-makers prioritise and balance the landscape style development and urban and rural green environmental protection. Strauser [4] has established a framework related to the narrative of landscape style and heritage to understand the urban and rural landscape change in the Midwest of the United States and explore the sense of locality and common values in the context of landscape change. At present, scholars have studied the effective visual transmission of urban-rural integration landscape from different angles, but there are still some deficiencies in its viewing effect and environmental protection. Traditional landscape design methods and tools are often limited to specific landscape elements or a single design concept, lacking the ability to handle complex scenes and dynamic changes. The lack of advanced technological means and tool support limits the innovation and implementation effectiveness of design schemes.

The in-depth development of AI technology provides more possibilities for reuse design and visual transmission of green and environment-friendly urban-rural integration landscapes. Ge and Darcy [5] proposed an interactive remote multimedia teaching system based on VR technology in order to improve the intelligence and human-computer

interaction capabilities of interactive remote multimedia teaching. Deng [6] designed a spatial gray-level co-occurrence matrix model based on AI technology, collected urban vegetation data maps through remote sensing images, and analysed urban landscape planning and visual communication. The scoring results showed that this method can well meet people's demand for green plants and is conducive to maintaining the ecological balance between urban biodiversity and urban space. However, most of the studies only focus on the theoretical level, without considering the actual visual communication needs of the urban-rural integration landscape.

This article aims to explore the visual communication effect of reuse design based on artificial intelligence and green environmental protection concepts in the landscape style of urban-rural integration. Through intelligent design methods, better understanding and communication of the landscape at the urban-rural junction can be achieved, providing more innovative visual design solutions for future urban-rural development. The innovation of this article lies in utilising artificial intelligence technology to develop intelligent design tools and algorithms, achieving automated landscape design and planning. By using intelligent tools and algorithms, design goals and constraints are determined, and optimised design solutions are automatically generated to improve design efficiency and quality.

Evaluation of visual communication of urban-rural integration landscape style

Overview of urban-rural integration landscape

Definition

Landscape is a complex formed by the interaction and integration of various ecosystems. According to the role of human activities, its composition can be divided into different landscape elements in the form of land use.

Urban landscape style is a visual model composed of various physical and non-material forms such as urban entities and living environments [7]. To some extent, it is connected with the city image and the visual information of the city, forming a whole composed of different visual events and different visual activities. Its definition can be understood not only from the level of urban image but also from the level of urban living environment. In the specific visual communication process, the landscape and existing resources of the city should be fully considered. In addition, human perception of the city is the most important evaluation principle of urban landscape style, and this perception is more of a spiritual perception.

The rural landscape style is composed of four types of landscape: nature, agriculture, settlement, and humanity, as shown in Figure 1. In terms of natural landscape, the overall landform, natural vegetation conditions, water system distribution, and other factors of the region constitute the natural environment landscape of the region. Natural landscape is not only an important part of rural landscape style but also determines the overall form of rural landscape style. Compared with natural landscapes, agricultural landscapes are closely related to human activities, which are the comprehensive results of crops, fields, and irrigation structures, reflecting information on rural production conditions and production levels [8]. The settlement landscape is composed of the geographical location, distribution mode, and building type of the settlement, which can reflect the climate conditions, resource conditions, historical values, and concepts of rural areas. The human landscape is

based on the other three landscapes, which is the comprehensive result of the three landscapes of nature, settlement, and agriculture. Rural landscape is the most direct embodiment of the relationship between man and land, which can directly reflect the current human impact and role in the natural system.

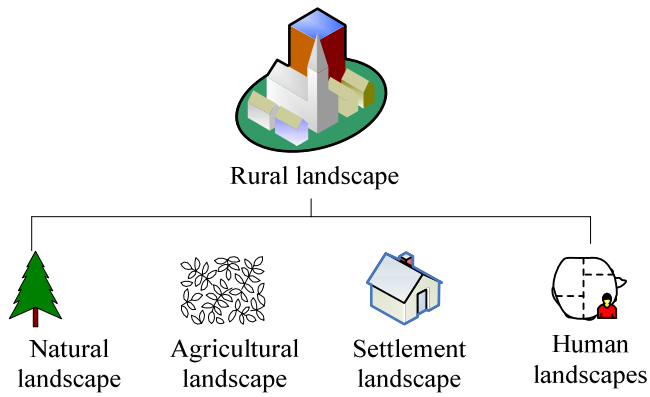

Fig. 1. Composition of rural landscape

The landscape style of urban-rural integration is formed by the interaction of urban and rural landscapes, which not only reflects the unique culture and tradition formed in the process of urban and rural development but also reflects the residential environment characteristics of urban and rural residents [9]. The "wind" in the landscape style of urban-rural integration is the soft layer of urban and rural humanistic tendencies, including the morphological characteristics of regional customs and other soft layers. "Appearance" refers to the tangible and intangible hardware level of cities and villages, such as streets, lakes, mountains, etc. Reuse design aims to reuse existing buildings, infrastructure, or spaces and transform, reconstruct, or reconfigure them to meet new functional, social, or environmental needs.

Elements

The elements of the urban-rural integration landscape style system can be divided into natural and human elements, as shown in Figure 2.

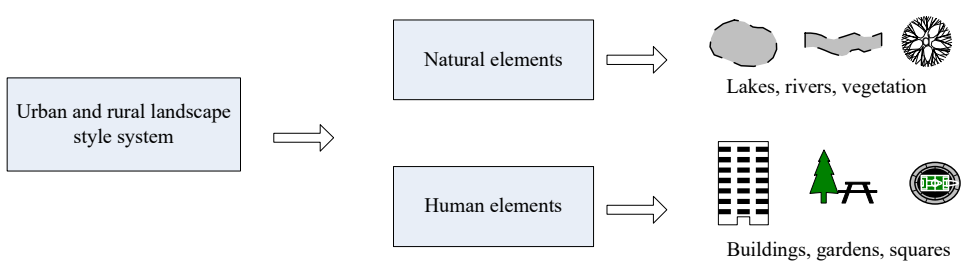

Fig. 2. Elements of urban and rural landscape style system

Some specific natural conditions between cities and villages, including lakes, mountains, and natural vegetation, are natural elements. In the design of urban and rural landscape styles, only by making full use of the natural elements of urban and rural landscapes and maximising the harmony of the natural elements of the two can people effectively form a distinctive urban-rural integration landscape style.

Human factors are various material elements produced by urban and rural people in the process of creating and transforming nature. For example, unique buildings, squares, and other elements constitute the main landscape of cities and villages. At the same time, the landscape is also an important part of human factors. It can add vitality to the city, and purify and improve the environment, and it is also an important space for human activities [10]. It integrates a large number of natural vegetation and natural landscapes and is the most natural man-made landscape element.

Visual communication requirements

Ensuring the coherence and integrity of the whole landscape

In the process of urban and rural expansion, maintaining the coherence and integrity of the regional landscape structure and landscape system is an important part of ensuring urban and rural ecological security [11]. If the structure of the landscape is broken, it would hinder the normal development of nature, including the natural growth of vegetation, mountains, and other elements. The lack of overall coherence and integrity of the landscape would lead to the loss of natural features in the urban-rural integration area, thus affecting the display of other functions of the landscape.

Protecting the diversity of the ecosystem

In the characterisation of urban and rural integration landscapes, special attention should be paid to the diversity of urban and rural patches to avoid the assimilation of urban and rural landscapes. At present, road construction, water conservancy construction, and farmland development in most areas have destroyed the local natural and cultural environment, resulting in a sharp decline in the diversity of urban and rural ecosystems. Therefore, in the visual expression of urban and rural integration landscape, people must focus on the protection of biodiversity and native plants. In addition, in the visual transmission of urban and rural landscapes, attention should be paid to avoiding localisation, strengthening the overall ecological service function, and trying to maintain the original natural community structure in the ecological representation of urban and rural landscapes to meet the best living environment of various animals and plants [12].

Good visual image and characteristics

The way of expression of urban and rural landscape visual information is directly related to people's life experience, and a good visual presentation effect can not only effectively display the regional visual image and characteristics, but also significantly enhance the regional cultural value. The basic goal of visual communication of urban-rural integration landscape is to optimise the urban and rural space environment, shape a good spatial order, and organically combine urban and rural open space, cultural value, architectural type, and other elements to form a beautiful spatial image. Urban-rural integration landscape is the main form of expression that reflects the living environment, spiritual outlook, and natural characteristics of urban and rural residents, and is

an important carrier that reflects urban and rural characteristics. The characteristics of an urban integrated landscape are the beginning of people's understanding of urban and rural areas, the external manifestation of the physical outlook of urban and rural areas, and the comprehensive embodiment of the development environment of urban and rural areas.

Artificial intelligence technology

As an important part of computer science theory, AI's core goal is to use machines to imitate human thought activities, thus replacing human beings in corresponding work [13]. In recent years, AI technology has undergone tremendous changes in vision, voice, natural language processing, and other aspects. Compared with general technology, AI has strong cognitive ability, and it can self-adaptation, self-learning, and self-growth [14]. Through machine learning, pattern recognition, and other technologies, the hardware equipment can understand the essence and laws of objective things and express them, so that the machine can imitate human thinking and complete most of the work. With the development of AI theory and the continuous innovation of information transmission methods, traditional landscape planning and design and its visual transmission mode are changing [15].

In a broad sense, with the support of AI technology, the visual transmission of urban-rural integration landscape style is to visualise information, that is, to disseminate urban and rural landscape information by visual perception, as shown in Figure 3. The process of visual communication of landscape features is mainly divided into three stages: collection, processing, and representation of landscape information.

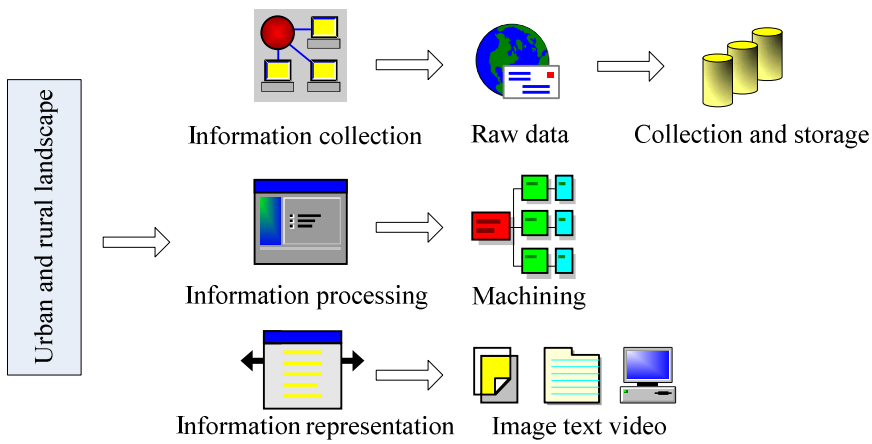

Fig. 3. Visual information transmission under artificial intelligence

From Figure 3, it can be seen that the collection of landscape information mainly includes obtaining source data, and collecting and storing it. Information processing mainly includes landscape information processing. The main ways of information representation include images, text, and videos. In the landscape of urban-rural integration, the visual representation dominated by AI technology can be divided into three types: selective information representation, diversified information representation, and personalised interface representation. The development of these three features makes AI technology

show three characteristics initiative, harmony, and efficiency in the visual transmission of landscape style [16, 17].

Initiative

The communication model can make the representation of landscape style content more active and can use perception technology to collect information about landscape and surrounding environment, to perceive and understand the current situation and level of regional landscape, understand and predict the functional requirements of landscape, and actively display information.

Harmony

AI technology can also improve the tightness between landscape elements using intention understanding while analysing the relationship between landscape elements, to achieve a higher integration of urban and rural landscape features [18, 19].

Efficiency

The personalised presentation of AI technology can adjust the content and structure of visual communication according to the functional requirements of the landscape, to better use the function of the landscape style and features, and to a certain extent enhance the interaction between the masses and the landscape.

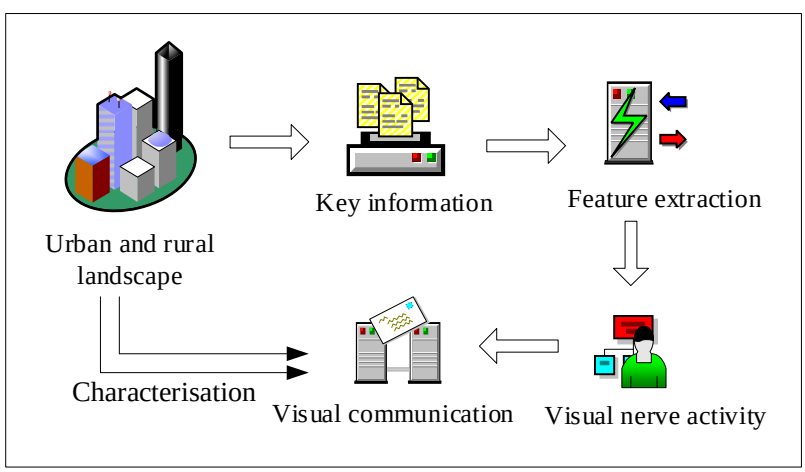

Fig. 4. Visual communication model

In the process of visual transmission of urban-rural integration landscape style, a new functional requirement is met by design and construction means, or by re-planning and layout of existing urban and rural landscapes to meet the new functional requirements. This continuation of the functional requirements of the landscape is called the reuse design of urban and rural landscape styles. AI technology can deeply explore and reuse existing landscape resources on the premise of complying with relevant policies and regulations. Based on inheriting and continuing the historical and cultural values of urban and rural areas, people should reasonably replace their internal and external functions, adjust and

transform the layout and external forms of urban and rural landscapes to meet the requirements of green and environmental protection and create new development values in the process of visual transmission [20, 21].

To realise the visual transmission of reuse design and green environmental protection urban-rural integration landscape style, fully display the core values of residents, maintain and inherit the historical style of urban and rural areas, and make it continue to play its due role in the new era, this paper proposes a visual transmission model of gradual migration based on AI technology, as shown in Figure 4.

From Figure 4, it can be seen that the progressive transfer visual communication model fully extracts features through key information recognition, and then communicates visually through visual neural activity. It is composed of a convolution neural network and can extract the semantic information of landscape images. It can also map the image with size $[3 \times 64 \times 64]$ to the latent image feature $(f_1, f_2, \dots, f_{T_x})$ with size $[1 \times 256]$. The formula is:

$$f_1, f_2, \dots, f_{T_x} = f_c \tag{1}$$

By automatically identifying and classifying various elements in landscape images, automatic recognition and classification of landscape elements can be achieved. This helps designers to analyse and understand landscape scenes more quickly and accurately, providing data support for design decisions. Among them, f_c [-] is a Convolutional Neural Network (CNN). To make the number of hidden characteristics of urban and rural landscapes consistent with the number of hidden characteristics of visual signals, this paper sets the duration of multi-temporal visual nerve activity to $x = [x_1, x_2, \dots, and\ x_{T_x}]$. It is input into the two-way Gated Recurrent Unit (GRU), and the latent image feature is obtained at this time, and expressed as $(s_1, s_2, \dots, s_{T_x})$:

$$s_i = \left[f_{GRU}\left(x_i, \overrightarrow{h_i}\right), f_{GRU}\left(x_i, \overleftarrow{h_i}\right)\right], \qquad i = 1,2, \dots, T_x \tag{2}$$

In the formula, the definitions of each parameter are shown in Table 1.

Table 1

Definition of formula parameters

Sequence	Parameter	Meaning
1	f_{GRU} [-]	Recursive neural network based on GRU
2	$\overrightarrow{h_i}$ [-]	Forward hidden state
3	$\overleftarrow{h_i}$ [-]	Backward hidden state
4	T [-]	Time point data

Compared with the traditional communication model, the communication model under AI technology contains fewer parameters and is easier to train.

Given the context vector $v = (v_1, v_2, \dots, v_{T_x})$, this paper trains the model to generate text $w = (w_1, w_2, \dots, w_{T_x})$. The joint probability distribution defined by the model is:

$$p(w) = \prod_{i=1}^{T_x} p(w_i | w_1, \dots, w_{i-1}, v_i) \tag{3}$$

In the joint probability distribution, each conditional probability is:

$$p(w_i|w_1, \ldots, w_{i-1}, v_i) = k(w_{i-1}, l_i, v_i) \tag{4}$$

Among them, k [-] is a nonlinear function; l_i [-] is the hidden state of the model in step i, and its calculation method is:

$$l_i = f_{GRU}(l_{i-1}, w_{i-1}, v_i) \tag{5}$$

In the repeated training of the model, the learning process is divided into two stages: progressive transfer and decoding. The concept of gradual migration comes from the increasing generation of confrontation networks. It is mainly to generate semantic information by analysing the landscape information and visual nerve activity in the progressive process. In the process of decoding, only semantic information needs to be generated through visual nerve activity. To evaluate the impact of visual nerve activity on landscape visual transmission at different time points, this paper calculates the weights of different time points:

$$\delta_i = \frac{exp(e_i)}{\sum_{k=1}^{T_x} exp(e_{ki})}, \qquad i = 1,2, \ldots, T_x \tag{6}$$

where e_i is the score of the queue, and the calculation formula is:

$$e_i = a_\delta tanh\left(d_\delta l_{i-1} + m_\delta\left(\beta s_i + (1-\beta)\right)\right) \tag{7}$$

Among them, a_δ [-], d_δ [-], and m_δ [-] are queue parameters. $tanh$ [-] is the activation function, β [-] is the adjustable parameter. Based on this calculation, the visual communication model can gradually understand the rich semantic content in the urban-rural integration landscape style, can convey highly recognisable signals from visual activities, and realise the reuse design of artificial elements such as buildings and gardens. Thus, the urban and rural landscape can be deeply integrated and present an ideal visual transmission effect based on maintaining its original characteristics and implementing the concept of green environmental protection [22, 23].

Visual communication experiment of urban-rural integration landscape style

To verify the visual communication effect of the reuse design based on artificial intelligence and the green and environment-friendly urban-rural integration landscape style, this paper took the case of a city's urban-rural integration landscape reconstruction design as an example and took the main components of the landscape system in the region as a sample. Under the visual communication model constructed in this paper, the visual communication experiment was carried out on each constituent element, and the effect of the visual communication model was verified from three aspects: feature extraction, visual communication effect, and environmental economic benefit coefficient. To ensure the objectivity of the experimental results, this paper compared it with the traditional visual communication model. The basic information of the region is shown in Table 2.

It can be seen from Table 2 that the area is 0.2043 km^2. The main feature of the landform are hills. The elements of the landscape system are divided into seven categories, among which the natural elements include wetlands, rivers, lakes, and mountains, and the artificial elements include forest parks, ethnic buildings, and leisure squares [24, 25]. This region is an important node in the development of urban-rural integration and has abundant natural and cultural resources, which is expected to become a link and demonstration area between urban and rural areas. The selection of the urban-rural

integration area of the city as the main case for landscape renovation design has a certain representativeness.

Table 2

Basic information on urban-rural areas

Sequence	Content	Information
1	Area	0.2043 km^2 (20.43 ha)
2	Landform	The main features are hills
3	Natural elements	Wetlands, rivers, lakes, mountains
	Artificial elements	Forest park, ethnic architecture, leisure square

Feature extraction

Before presenting a good visual communication effect, it is necessary to extract the key features of each constituent element in the landscape system. The greater the amount of feature extraction of the model, the higher the degree of feature retention of the landscape element, and the more ideal the final communication effect would be. This paper compared the feature extraction effects of the two types of models on the seven main components (the sequence is 1-7) of the urban and rural landscape system, as shown in Figure 5.

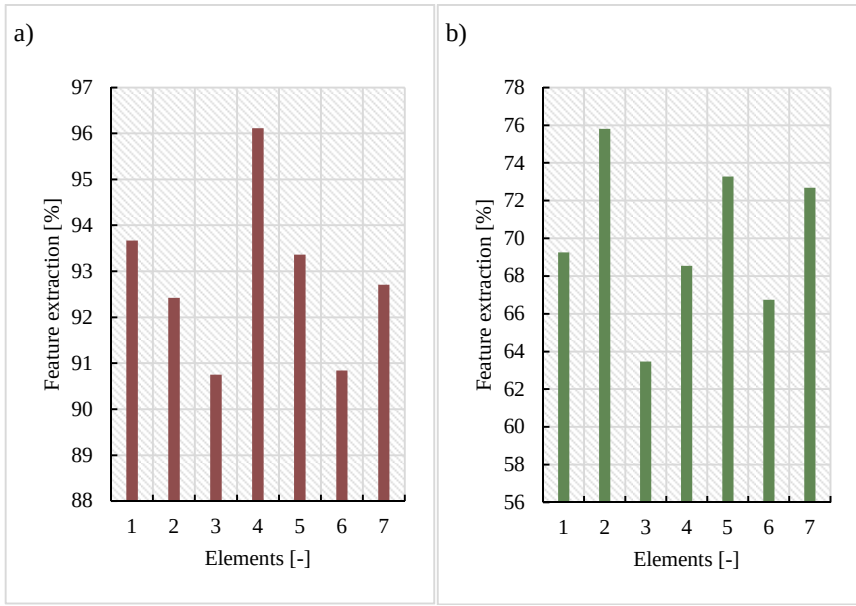

Fig. 5. a) Model feature extraction results in this paper, b) traditional model feature extraction results

From the results in Figure 5, there were significant differences between the two types of models in feature extraction of landscape system components. In Figure 5a, the visual communication model based on AI technology achieved 93.67 %, 92.42 %, 90.75 %, 96.11 %, 93.36 %, 90.84 %, and 92.71 % in the feature extraction of the seven constituent elements. Among them, the highest extraction rate of this model was 96.11 %, and the average extraction rate was about 92.84 %. In Figure 5b, the results of the traditional model

in feature extraction of seven types of constituent elements were 69.25 %, 75.81 %, 63.46 %, 68.54 %, 73.28 %, 66.74 %, and 72.69 % respectively. Among them, the highest extraction rate of the traditional model was 75.81 %, and the average extraction rate was about 69.97 %. It can be seen that the feature extraction of the traditional model was not comprehensive enough to retain the characteristics of the urban-rural integration landscape. The visual communication model based on AI technology can effectively extract the main elements of the landscape in the region, maintain the original style of natural resources and human resources such as wetlands, rivers, forest parks, and ethnic buildings, and enrich the visual communication content and information.

Visual communication effect

The visual communication effect of urban-rural integration landscape refers to the viewing of each constituent element and the coordination in the overall landscape style. Good viewing is the basic requirement of visual communication, while harmony is the necessary condition for the healthy development of the urban-rural integrated landscape. The evaluation of the visual communication effect in this paper adopted the expert scoring method. Eight experts were invited to score the viewing and harmony of each element after applying different models. The invited experts are landscape design professionals, art designers, or scholars and researchers in related fields, with more than 5 years of rich experience in related fields. The score is 1-5 points. The higher the score is, the better the visual communication effect of the model is. Assign weights to ornamental and harmonious indicators based on feedback from landscape users and expert opinions. Among them, the ornamental weight is 0.6, and the harmonious weight is 0.4. The scoring process is double-blind and multi-round, ensuring objectivity and consistency. The scoring results are shown in Figure 6.

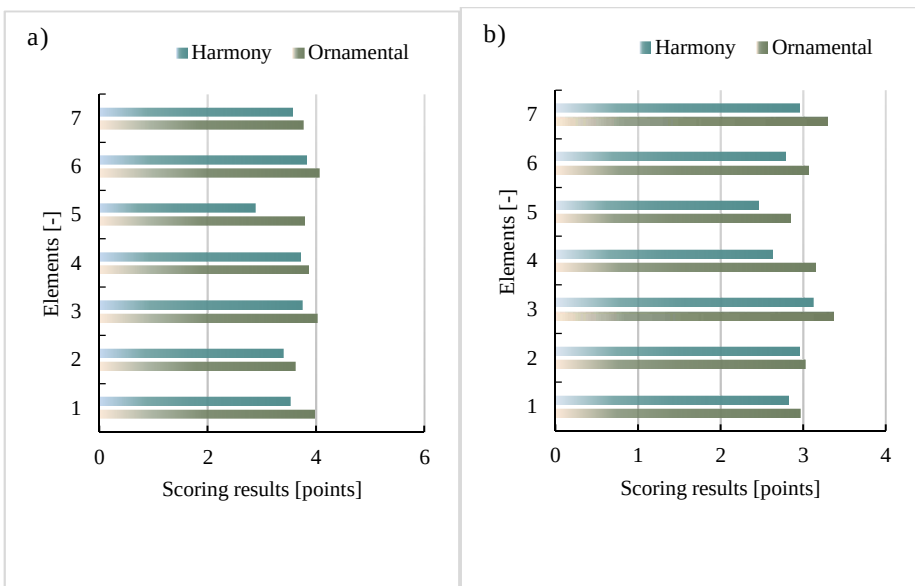

Fig. 6. a) Visual communication effect of this model, b) visual communication effect of traditional model

It can be seen from Figure 6 that the visual communication effect of urban and rural integration landscape based on AI technology was ideal. In Figure 6a, the average ornamental score of each element was about 3.87 points, while the harmony score was about 3.52 points. In Figure 6b, the average value of each element's ornamental score was about 3.10 points, while the harmony score was about 2.82 points. From the specific results, the viewing and harmony of each element under the traditional model is difficult to meet the functional requirements in practical applications, while the viewing and harmony of each element after the application of this model are generally high. From the specific comparison results, compared to traditional models, the visual communication of urban and rural integrated landscapes based on AI technology has an average score of 0.77 points higher in terms of aesthetics and 0.70 points higher in terms of harmony. This indicates that AI technology can effectively improve the aesthetics and harmony of landscape design. With the support of AI technology, the model can enhance the appreciation of natural elements and artificial elements through diversified representation forms, and at the same time comprehensively understand the overall situation of urban and rural areas and other objective information to achieve a high degree of harmony among various landscape elements.

Environmental and economic benefit coefficient

The coefficient of environmental and economic benefits is the key indicator to judge the feasibility of landscape visual transmission of environmental and economic benefits. Generally, this indicator is required to be greater than 1, indicating that the benefits are greater than the costs. The economic profit and loss analysis of the landscape environment is very important for coordinating and developing the economy and protecting the environment when reusing the design and green environmental protection urban-rural integration landscape style and features for visual transmission. The calculation of the environmental and economic benefit coefficient EE is the following [26, 27]:

$$EE = \frac{E_v}{ROI} \tag{8}$$

where, E_v is the increase in ecological service value brought by landscape design; ROI is the return on investment.

This paper compared the environmental and economic benefit coefficients of the landscape components under the two models, as shown in Figure 7.

In Figure 7a, the environmental and economic benefit coefficients of each element under the model in this paper reached 1.216, 1.391, 1.207, 1.098, 1.152, 1.187, and 1.223 respectively, with the highest coefficient reaching 1.391. In Figure 7b, the economic benefit coefficients of each factor under the traditional model were 1.003, 1.101, 0.963, 1.024, 0.986, 1.132, and 1.048 respectively, of which the highest coefficient was 1.132. From the concrete results, it can be seen that the advantages of this model are more significant. The AI-based communication model can effectively excavate the potential resources of the landscape, and reuse the potential resources based on intelligent technology. It can not only effectively display the characteristics of an urban-rural integration landscape, but also promote environmental green development, deeply integrate the environmental protection concept, and significantly improve the environmental and economic benefits.

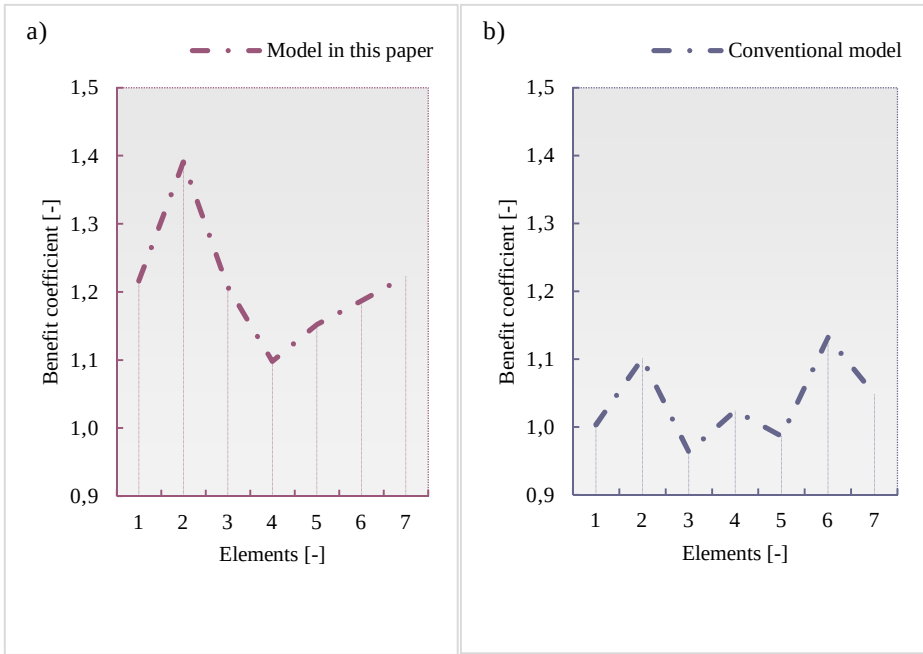

Fig. 7. Environmental and economic benefit coefficient under: a) this model, b) traditional model

Conclusion

With the coordinated development of the social economy, the relationship between urban and rural areas has become increasingly close. Through scientific planning and guidance, shaping the landscape style of urban-rural integration is not only the main content of regional construction but also one of the important directions to promote the development of urban-rural integration. To improve the visual expression effect of the current urban-rural integration landscape style, this paper proposed a visual communication model based on AI technology. It has effectively improved the landscape style and harmony of the current urban-rural integration area and significantly improved the environmental and economic benefit coefficient of the landscape style on the premise of fully extracting the regional characteristics and environmental information characteristics. This can not only effectively reduce the cost of visual communication, but also fully implement the principle of green environmental protection and realise the reuse design of existing landscape resources. Combining artificial intelligence technology and visual communication theory, not only expands the application fields of landscape design theory but also provides new theoretical support for achieving urban-rural integration development. Promote urban-rural integration and coordinated development through landscape reuse design. This design method can establish effective connections and interactions between urban and rural areas, breaking the traditional urban-rural boundary and providing practical reference and inspiration for the reuse design of urban and rural landscapes. Although the research on the reuse design based on AI and the visual communication of green and environment-friendly urban-rural integration landscape style

in this paper has a certain guiding role in the planning and characterisation of urban-rural integration landscape, there are still some areas that need to be further improved in the research process. The design generated by artificial intelligence may not fully consider the aesthetic preferences and environmental characteristics of different cultural and regional backgrounds, thereby limiting its applicability in practical scenarios. In future research, it would improve the visual communication level of landscape style and promote the further integration of urban and rural areas with effective practice and theoretical support.

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