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Computer-Aided Design AND APPLICATIONS

Optimization of CAD Application in Tourism Landscape Planning with Deep Learning

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Abstract. With the development of the economy and society, people's living standards continue to improve. Traditional tourism landscape and scenic area planning can not meet people's spirit and modern needs; the tourism industry, in order to develop in the long run, must adjust the tourism landscape planning and design from the perspective of tourists. This paper is based on a deep learning algorithm to optimize the application of CAD technology in tourism landscape planning. Firstly, the function of CAD technology in tourism landscape planning and design is analyzed. Three-dimensional modelling and image processing functions of CAD tools are used to improve the efficiency and display effect of tourism landscape planning. Finally, on the basis of CAD technology, a deep learning algorithm is used to optimize and improve the image quality of tourism landscape planning and refine the landscape layout. Make tourism landscape planning more in line with people's individual needs. The research results show that the CAD technology optimized by deep learning algorithm has high efficiency and accuracy in tourism landscape planning, image modelling, and processing, and the optimized tourism landscape layout can meet people's needs for modern, ecological, intelligent, and tourist scenic spots.

Keywords: Deep Learning; CAD Technology; Tourist Landscape; Planning and Design; Three-Dimensional Modeling
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1 INTRODUCTION

The planning and design of the tourism landscape are reflected in the layout of tourist attractions and related places. The relevant planning needs to ensure that tourists have normal rest places and provide them with safe and comprehensive services to alleviate the fatigue of tourists during tourism [1]. In addition, the tourism landscape also needs to meet the complex needs of tourists for culture, beauty, intelligence, and other tourist attractions [2]. It can be seen that the tourism landscape refers to the whole of space and objects, which are complex natural environments and human

activities. Due to the different geographical locations and ecological environments of tourist areas, the tourism landscape area with unique functions and dynamic vision is formed under mutual interference [3]. In general, tourism landscape planning should not only include natural landscape and cultural landscape architecture but also provide tourists with comprehensive functional places such as rest, entertainment and shopping.

Virtual 3D model analysis of architectural heritage information models not only provides a new way for the preservation and inheritance of architectural heritage but also demonstrates enormous potential in the field of tourism landscape planning [4]. Tourists can not only freely explore, click, and drag in the virtual environment, experiencing an immersive and immersive experience, but also customize personalized travel routes according to their interests and needs. This interactivity not only enhances the sense of participation of tourists but also makes tourism landscape planning more humane and diverse. By building a realistic virtual environment, tourists can gain a deeper understanding of Jeddah's history, culture, architectural style, and landscape features. By constructing a 3D cloud data recovery system under an augmented reality architecture, we can achieve precise simulation and reproduction of historical buildings and landscapes. The application of interactive virtual BIM (Building Information Modeling) technology in tourism landscape planning greatly enriches the experience of tourists [5]. This not only helps to increase the visibility of Jeddah's tourism industry but also promotes the inheritance and development of local culture. Through CAD technology, designers can more accurately simulate and present various aspects of tourist landscapes, including terrain, vegetation, architecture, etc. Combining tourism landscape planning, CAD (Computer Aided Design) technology also plays a crucial role in the development of virtual tourism interactive products. Driven by virtual reality technology, an emerging upwind display system has provided a new perspective for tourism marketing. By analyzing the details that affect the product experience in-depth, designers can create virtual tourism interactive products that better meet the needs of tourists, thereby promoting the sustainable development of China's tourism industry [6]. The head-mounted virtual display system, as an important component, provides personalized tour guide services for tourists. Tourists can freely navigate, explore attractions, and even interact with elements in the virtual environment through their head-mounted devices. This system provides tourists with a more vivid and intuitive travel experience through the construction of different virtual reality environments.

In the planning and design of a tourism landscape, it is necessary to grasp the context of human and historical development, actively develop landscape areas with cultural characteristics and folk customs, integrate different cultural materials, and achieve accurate positioning of the layout. In modern life, people are pursuing more and more spiritual needs, which also poses new challenges for the layout and planning of the tourism landscape [7]. The planning and design of the landscape should be coordinated with each other and conform to the aesthetic principle so that the planning and design work is more scientific. At the same time, it should also meet people's psychological needs for tourist areas, and improve tourists' sense of identity and the sense of belonging of local residents in tourist landscapes. Create a modern style with a beautiful ecological environment and reasonable landscape planning and layout. Designers need to optimize the local environment and start with the characteristics of the tourist area. In the environment to give people a higher level of enjoyment, imperceptibly improve the aesthetic experience [8]. In the process of planning and layout, the non-linguistic cultural functions of the tourism landscape should also be brought into play, so as to keep tourist attractions in line with people's behavioural psychology, adjust mass emotions, stimulate tourist consumption, and drive steady growth of the local economy of the tourism landscape.

In the field of tourism landscape planning, it is crucial for users to truly experience the environment, culture, and customs of the tourism destination, as well as to have an early understanding of the appearance, facilities, and surrounding environment of the house, in order to improve tourist satisfaction and travel experience [9]. For example, they are providing detailed virtual tours of ancient architecture and museums for tourists who enjoy history and culture, and offering virtual reality experiences of natural scenery for tourists who enjoy outdoor exploration. On the basis of virtual tourism products, design offline activities such as truthful guides, cultural lectures,

experiential courses, etc., so that tourists can further understand and experience the culture and customs of the destination after virtual experiences. For example, when visiting ancient buildings, tourists can see the historical changes and restoration process of the buildings through AR devices, enhancing respect and appreciation for cultural heritage. Integrating AR technology with tourism landscape planning to provide tourists with a richer and more authentic experience. Add social functions to virtual tourism products, allowing tourists to interact, share experiences, and exchange insights with other tourists [10]. This can not only increase the sense of participation and belonging of tourists but also provide more user feedback and improvement suggestions for tourism landscape planning. Tourists can explore the natural scenery, cultural heritage, and local life of their destination at home through head-mounted devices or mobile applications. This technology not only makes booking and travelling easier and more enjoyable but also stimulates tourists' interest and curiosity towards the destination. How to integrate these experiences into virtual tourism products to attract more users while also satisfying tourists who prefer traditional travel methods has become an important challenge.

Although tourism landscape planning and design has become a hot topic concerned by the tourism industry, there are many problems in planning and design from the actual situation. Designers and planners need to have a strong sense of reflection, combined with the actual situation of the local tourism, clear planning points, and constantly optimize the landscape design scheme. Traditional tourism landscape planning and design has some problems, such as relatively single landscape function and, lack of comprehensiveness and science. For example, many designers are keen to create fixed-shaped areas in landscape planning, which will restrict the normal activities of tourists in the tourist site. In addition, there is also the problem of incoordination between plant landscape and modern landscape, which can not meet people's demand for tourism landscape experience if it reflects ecology and modernization too much. Landscape layout elements need to be matched from a scientific and reasonable perspective. It can be seen that we need to continuously optimize the landscape planning and design scheme, achieve the accurate positioning of landscape functions, and use modern technology to assist the planning and design process. Deep learning algorithms and CAD technology have good applicability in image processing, three-dimensional modelling, element feature extraction and other aspects. This paper also applies them in the research of tourism landscape planning, so as to explore the embodiment of their application effects in tourism landscape planning and layout.

2 RELATED WORKS

Oncioiu and Priescu [11] studied the finite element tourism experience of virtual reality technology in tourism landscape planning. Tourism landscape planning utilizes virtual reality technology to provide tourists with a brand-new immersive experience. Different cultural backgrounds and values can affect tourists' perception and understanding of landscapes in virtual environments. In the application of virtual reality in tourism landscape planning, this cultural construction is reflected in the creation, presentation, and interpretation of virtual environments by tourists. The postmodern theory reminds us that the sense of reality in virtual tourism is not a single experience, but a diverse experience shaped by the cultural background and values of tourists themselves. In tourism landscape planning, virtual reality technology provides infinite possibilities for designers and planners. Osman et al. [12] analyzed its data framework and topic analysis algorithms from a postmodern perspective. This technology can not only help tourists understand the characteristics and landscapes of the tourist destination in advance but also provide them with a more intuitive and vivid experience, thereby enhancing their travel interests and expectations.

Postmodernism emphasizes the relativity and subjectivity of culture, believing that culture is a construction rather than an objective fact. They can use virtual reality technology to simulate various landscape scenes, including historical relics, natural scenery, urban scenery, etc., allowing tourists to preview and experience in a virtual environment. In addition, they also need to pay attention to the experience feedback of tourists in the virtual environment, and continuously optimize and improve the design and presentation of the virtual environment, in order to increase tourist satisfaction and

loyalty. Designers and planners need to have a deeper understanding of the cultural background and values of tourists in order to create landscape scenes that better meet their needs in virtual environments. Meanwhile, virtual reality technology has also brought new challenges and opportunities to tourism landscape planning. Poux et al. [13] delved deeper into the tourism landscape environment through the metaverse, interacting and experiencing with the landscape. This interactive experience can not only enhance the sense of participation and immersion of tourists but also provide more data support and innovative ideas for tourism landscape planning. In Metaverse, tourism landscape planning can expand the scope of tourism resources and support the development of sustainable tourism by providing alternative and profitable resources.

In order to improve the happiness and consumption experience of the people, the country has clearly proposed in the tourism landscape layout plan to strengthen the intelligent digital construction of scenic spots and enhance the tourism experience of the people. The rapid development of the Internet and artificial intelligence technology provides a basis for tourism landscape planning and design. In the process of image generation in planning and design, it is inevitable to meet the requirements of image recognition and processing. Deep learning algorithms can learn collected landscape features and combine them with real-time landscape image recognition results to form intelligent landscape planning schemes. Meanwhile, tourist attractions contain a large amount of landscape data, which includes not only natural landscapes but also cultural landscapes. In image retrieval and recognition processing, deep learning algorithms can classify and extract colours, textures, and shapes. Deep learning algorithms, as a branch of machine learning, utilize neural network structures to output learning features and improve the detection and classification performance of the system. According to literature research, the application of deep learning algorithms started earlier in foreign countries. Suprayogi and Eko [14] applied deep learning algorithms to visual processing. By using a modelling method similar to the human brain, the training frequency of low-level feature combination data is continuously increased to explore the diverse distribution patterns of visual elements. With the help of deep learning algorithms, this type of computer vision has been widely applied in various fields such as facial recognition, license plate recognition, pedestrian detection, and vehicle detection.

In tourism landscape planning, it is crucial to fully consider and strengthen the factor of "existence" in order to enhance the overall tourism experience of tourists. This positive experience will further encourage tourists to give higher evaluations of the overall image of the tourist destination. Secondly, planners need to pay attention to the authenticity and vividness of the landscape, and through detailed design and environmental creation, let tourists feel a strong sense of authenticity and immersion during the tourism process. When tourists feel a high degree of authenticity and vividness in the tourism landscape, their sense of existence will be greatly enhanced, making it easier for them to immerse themselves in the tourism process, deeply experience and enjoy the fun and value brought by tourism. In order to achieve this goal, tourism landscape planning needs to take a series of measures to enhance the "presence" of tourists. Firstly, planners need to have a deep understanding of the cultural background, interests, and tourism needs of the target tourists to ensure that the planned landscape can resonate and interest tourists. In addition, with the continuous development of technology, advanced technologies such as virtual reality (VR) and augmented reality (AR) have also provided new possibilities for tourism landscape planning. By combining these advanced technologies, tourism landscape planning can further enhance the sense of existence of tourists, bringing them a more unique and unforgettable tourism experience. These technologies can simulate realistic virtual environments, allowing tourists to experience real tourist landscapes in the virtual world. By gaining a deeper understanding of tourist needs, emphasizing the authenticity and vividness of the landscape, and utilizing advanced technology to create a realistic virtual environment. In summary, in tourism landscape planning, emphasizing and strengthening the regulatory role of "existence" is crucial for enhancing the overall tourism experience of tourists.

In tourism landscape planning, it is crucial to fully consider and strengthen the "existence" factors to improve the overall tourism experience of tourists. This positive experience will further encourage tourists to give higher evaluations of the overall image of the tourist destination. Secondly, planners need to pay attention to the authenticity and vividness of the landscape, and through detailed design

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3 RESEARCH ON THE APPLICATION OF CAD TECHNOLOGY IN TOURISM LANDSCAPE PLANNING

3.1 CAD Technology in Tourism Landscape Planning

With the rapid development of social urban construction, the natural environment area has become fragmented. The construction and planning of the tourism landscape have also undergone corresponding changes. Some tourist landscape areas ignore the ecological environment and aesthetic value, which not only affects the tourists' play experience but also affects the local residents' living life. Therefore, the country should put forward more scientific and intelligent tourism landscape planning and design standards in order to protect tourist scenic area resources. At the same time, tourism landscape planning also refers to the re-layout analysis and evaluation of landscape resources in the local tourism area to optimize the landscape layout, improve the quality of the tourism landscape, promote the development of tourism, and other tasks. Landscape planning is a process with positive influence. Whether the planning layout is reasonable directly determines the tourist experience and the popularity of tourist attractions. Through tourism landscape planning, the local tourism industry can accurately evaluate the natural and cultural landscape and formulate a development plan that not only meets the needs of tourists but also protects the ecological and

cultural environment. Secondly, reasonable tourism landscape planning can promote local economic development. The tourism area excavates all tourism resources and provides diversified tourism products. Increase attractiveness and competitiveness while expanding economic benefits. Finally, the practical significance of tourism landscape planning is also reflected in the protection of local quality and image of tourism. Landscape planning should not only satisfy the aesthetic feeling but also pay attention to the overall image, integrate buildings, roads, and public facilities in many aspects, create a perfect tourism environment, and leave a good impression on tourists.

Tourism landscape design creates a combination of nature and environment in a certain area by changing the layout of terrain, plants, buildings, decorative roads, and so on. Planning designers initially used the method of drawing design drawings by hand, which has obvious shortcomings in the generation process of traditional planning schemes. In this paper, CAD computer-aided drawing tools are used to improve the efficiency and effect of landscape planning and design drawing generation. In recent years, the application of CAD technology in tourism landscape planning in China has also increased significantly. At present, the tools used in tourism landscape design are mainly divided into two categories: positioning technology and traditional image processing software. Tools containing data positioning technology are mostly used in the planning and design of scenic spots, which can actually generate terrain and background, as well as manage and analyze geographic data. Traditional image processing software is more used in garden planning, stereograms, and rendering. We apply 3D modelling tools in CAD technology to deal with image and layout problems in tourism landscape planning. The previous landscape design system has limited 3D display effect ability. The overall structure of the 3D landscape planning display system formed by using CAD tools is shown in Figure 1.

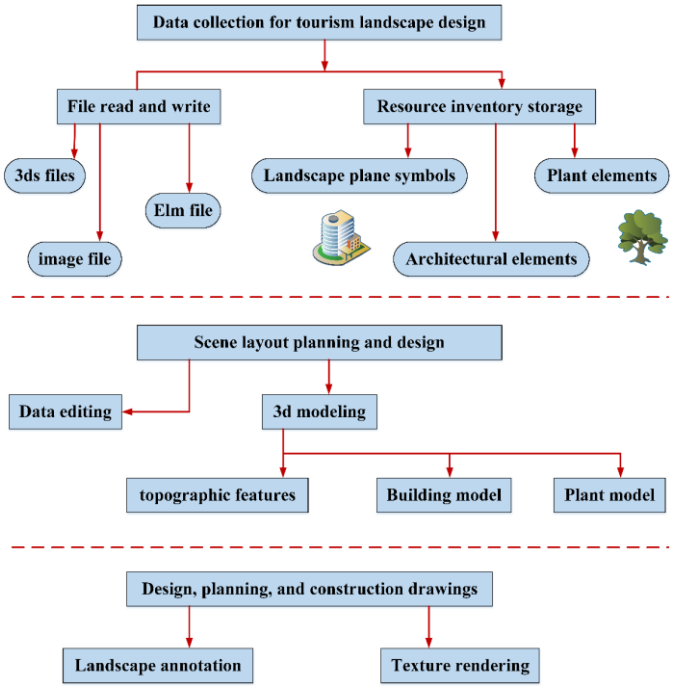

Figure 1: The overall structure of a 3D landscape planning and display system formed by CAD tools.

As can be seen from Figure 1, the tourism landscape design data collection is first divided into two modules: file reading and writing and resource library storage. Through the collection of tourist landscape plane symbols and various pictures, it is added to the scene layout planning and design to complete three-dimensional modelling and tourism landscape annotation, and finally, the effect

display is realized in the texture rendering. In order to improve the data acquisition of landscape environment by 3D modelling system. We use the formula to express the changes between the regional coordinate systems of the tourism landscape:

$$T_{3D} = \begin{bmatrix} a_{11}, a_{12}, a_{13}, a_{14} \\ a_{21}, a_{22}, a_{23}, a_{24} \\ a_{31}, a_{32}, a_{33}, a_{34} \\ a_{41}, a_{42}, a_{43}, a_{44} \end{bmatrix} \tag{1}$$

In the process of coordinate transformation, there are several submatrices for geometry, translation, and projection, respectively. The collected data are stored in the CAD system to facilitate the stitching of tourist landscape images. According to the three-dimensional coordinate linear equations, the parameter formula of the transformation matrix can be defined as follows:

$$x = (a_{11}, a_{21}, a_{31})y = \begin{bmatrix} a_{11} \\ a_{12} \\ a_{13} \end{bmatrix} \tag{2}$$

Among them, x and y Represents the changed matrix coordinates. It is assumed that the set of all feature points of the tourist landscape layout can be represented by Ordinal Numbers respectively. Then, there is a mapping relationship between feature points, whose three-dimensional direction is expressed as:

$$r(x_1, y_1, z_1) = a_0 + b_0 + c_0 \tag{3}$$

The vector definition expression of any two points in the tourism landscape is as follows:

$$t - q = q_0(r_{11}, r_{12}, r_{13}) + x \bullet y \tag{4}$$

According to the above formula combined with the rotation matrix, the constraint formula for the feature points is derived:

$$m = \frac{q_2 - q_1}{|| q_0 - q ||} \tag{5}$$

$$m_i = RM_0[q + q^2] \tag{6}$$

Since uncertain factors will cause the image to produce noise to different degrees, this noise will affect the accuracy and feedback speed of the tourism landscape planning system formed by CAD. Subsequently, we used deep learning algorithms to optimize the visual features of the data and extracted tourists' emotional tendencies towards tourism landscape planning and layout so as to design personalized and intelligent landscape places that meet the needs of the masses.

3.2 Application of CAD Technology in Tourism Landscape Planning

In the current tourism landscape planning, most of the planning and design are single, limited to a specific landscape element or functional requirements, and lack of overall layout and system. Single planning often only focuses on the development of a single scenic spot or building while ignoring the positioning and development ideas of the entire tourism landscape, which will lead to a weak correlation between various elements in the landscape, and it is difficult for tourists to experience streamlined services during the tour. Such traditional planning and design makes it easy to ignore the integration of the overall ecological environment and culture of the tourism region, resulting in a significant gap between the actual planning effect and the expected goal, and it is difficult to achieve green and ecologically sustainable development. We use CAD tools to complete the construction of the tourism landscape planning system and display the tourism landscape planning map in the three-dimensional model. However, in the actual study, CAD technology has obvious defects in extracting image features and visual symbols. In the face of the tourism masses' modern and personalized demand for landscape planning, we add a deep learning algorithm to optimize the CAD

tourism landscape planning system. First of all, tourists' evaluation of tourism landscape planning is used as the adjustment parameter. The evaluation process uses the tourism landscape planning image as the sample and asks the experiencer to score the planning layout. The collected evaluation data are processed using standardized methods, and the calculation formula is as follows:

$$Z_{ij} = (R_{ij} - R_j) / S_j \tag{7}$$

$$Z_i = \sum\nolimits_i Z_{ij} / N_j \tag{8}$$

The formula, Z_{ij} Represents the standard value of landscape planning evaluation by different evaluators. Extract tourists' demand for tourism landscape planning and establish the relevant data proportion chart, as shown in Figure 2.

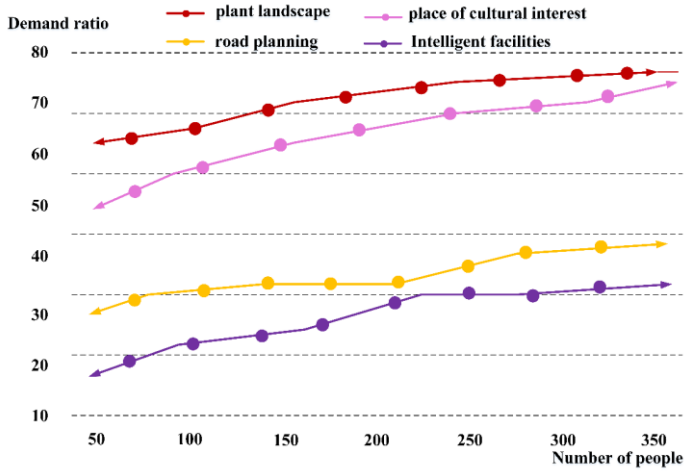

Figure 2: Related data proportion chart.

It can be seen from Figure 2 that the quantitative analysis is carried out from the number and proportion coefficient of tourists respectively. Among them, most tourists have a great demand for plant landscapes and cultural landscapes in tourism landscape planning, followed by road planning and intelligent facilities. It can be seen that tourism landscape planning should not only adjust the proportion of ecology and architecture but also provide a more convenient traffic environment. Due to the characteristics of the deep learning algorithm, in the network structure processing, each neuron will receive data as an input value, and pass the CAD parameters to the next layer after the mapping relationship processing. This mapping relationship is also the activation function, which also provides optimized modelling capabilities for CAD systems and improves the performance of system tools in dealing with nonlinear problems. The expression formula of the activation function is as follows:

$$\Phi(z) = \frac{1}{1+e^{-z}} \tag{9}$$

$$\tan(x) = \frac{e^z - e}{e + e^{-z}} \tag{10}$$

The function has the characteristics of derivation and smoothness. However, due to gradient descent and training problems, we also need to use noise removal to improve the fit of the formula. In the improved version of the formula, the feature point data of the negative gradient value is added, and after entering the pooling layer, that is, the sampling layer, the influence outside the parameters can

be reduced for the purpose of simplifying the calculation. The direct output of the input signal plays an obvious role in the detection and recognition of landscape planning images. The specific expression is as follows:

$$y = \frac{e^{a_k}}{\sum_{i=1}^{n} e^{a_i}} \tag{11}$$

Among them, y Represents the random input signal and is the corresponding exponential function. Since there are many elements involved in tourism landscape planning, compression and residual processing of different features are also needed to prevent the interference between different elements from affecting the output of the planning system. The residual calculation formula is as follows:

$$Mish = x \times \tanh(\ln(1 + e^{x})) \tag{12}$$

The calculated data can satisfy the parameterized distribution in the CAD model and reposition the three-dimensional coordinates therein:

$$u = B_i u_i + B_j u_i + B_r u_i \tag{13}$$

$$v = m^i + n_j + (x, y, z)^3 \tag{14}$$

Finally, the non-parametric calculation results of the coordinate matrix are derived by using conjugate calculation:

$$m_o = \sqrt{(m_x)^2 + (m_y)^2 + (m_z)^2} \tag{15}$$

Next, the deep learning algorithm is used to optimize the image segmentation effect of CAD technology in tourism landscape planning. Transform the image into different parts and objects, such as trees, flowers, buildings, etc. Traditional CAD landscape planning element analysis only uses the pixel point statistics method and deep learning artificial network collection, which can improve the collection efficiency of the system and reduce the influence of subjectivity. In the three-dimensional modelling environment, the layout of relevant elements in the tourism landscape is quickly constructed. Deep learning algorithm optimized the CAD model to complete the landscape planning and construction process, as shown in Figure 3.

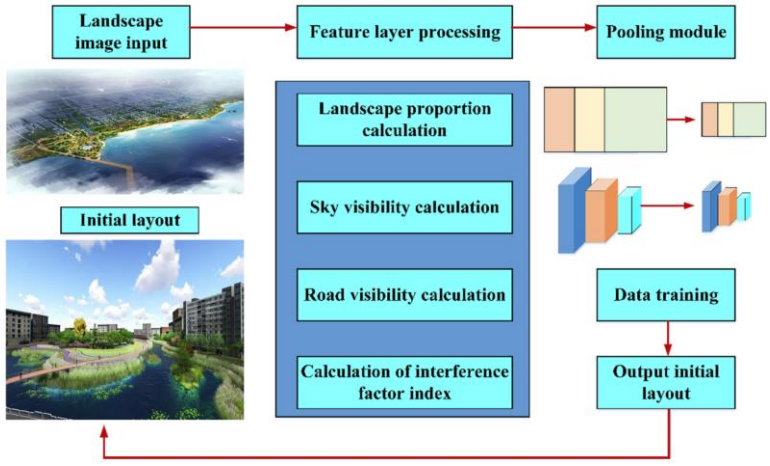

Figure 3: Deep learning algorithm optimization of CAD model landscape planning and construction process.

As can be seen from Figure 3, after the input of landscape images, the deep learning algorithm completes the calculation of plant landscape proportion, sky visual field, road visual field rate, interference factor index, etc., after processing the feature layer. The quantitative data of landscape elements are added to the neural network pooling module, and the initial layout of tourism landscape planning is output after data training and prediction.

4 ANALYSIS OF APPLICATION RESEARCH RESULTS OF A DEEP LEARNING ALGORITHM IN TOURISM LANDSCAPE PLANNING

4.1 CAD Technology of Tourism Landscape Planning 3D Modeling Analysis

Three-dimensional modelling is the core of tourism landscape planning and scene design, which is mainly responsible for the planning of landforms, buildings, plants and trees, humanistic landscapes, etc. According to the design results of the model, the construction drawing is drawn to complete the construction of the tourist landscape scene. We use CAD technology to make a tourism landscape planning system. The ground landscape layout model is generated by digital and image overlay. Among them, the basic data involved are mainly plant and building height data. The method of obtaining height data is to extract the relevant information directly from the image and build a stereoscopic model by using the three-dimensional data vector. Among them, human landscapes and facility buildings use fine modelling, and plant landscapes can use ordinary modelling and mixed modelling. The fine modelling method is closer to the actual scene. In order to verify the effect of CAD technology in tourism landscape planning, we compared the efficiency of general tourism landscape planning and CAD technology in 2D and 3D scene construction, as shown in Figure 4.

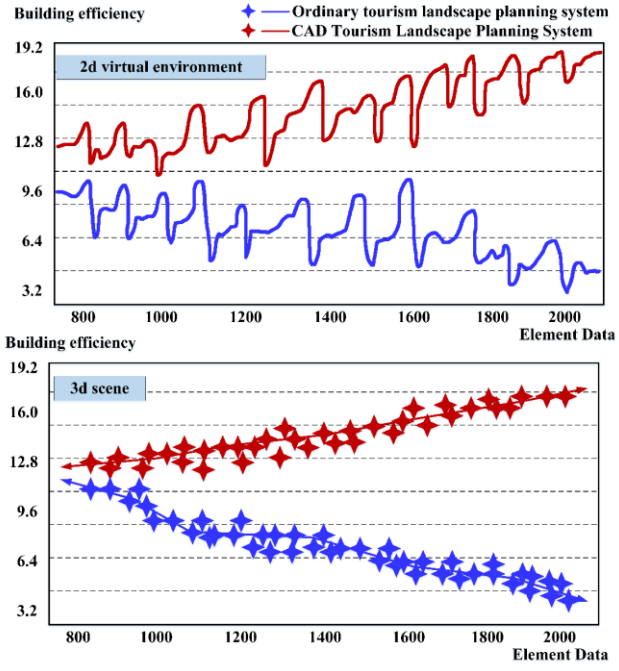

Figure 4: The Efficiency of Ordinary Tourism Landscape Planning and CAD Technology in Building 2D and 3D Scenes.

As can be seen from Figure 4, the efficiency of the general tourism landscape planning system in the construction of 2D and 3D scenes is low. The efficiency of CAD systems in 2D and 3D scene

construction is obviously higher than the standard coefficient. The texture of the landscape architecture involved is obtained by using the field shooting film. These parameters are added to the adjustment module in the CAD system, and the orthographic projection of the original resolution can be used to restore it in the three-dimensional space. Therefore, when data is input and collected, designers need to understand the overall situation inside the tourism landscape area, pay attention to the landscape planning direction, and ensure that the layout and ecological environment map each other. In addition, in order to improve the ecological effect of the tourism landscape, we adopted different rendering methods in CAD models to optimize the details of plant and tree models in the visual design of plants and trees. By adding multiple levels of detail to each layer, the layout of tree Spaces and cultural facilities can be combined with parametric management to meet the different needs of tourists and surrounding residents for an integrated landscape.

4.2 Analysis of the Application of CAD Technology in Tourism Landscape Planning

Tourism landscape planning and layout should be scientific and rational, pay attention to the overall planning and zoning planning, and fully take into account the local natural environment, regional characteristics and cultural traditions. Through space adjustment, the commercial areas of public facilities in scenic spots can be evenly distributed to avoid resource waste and resource congestion. In addition, it is also necessary to protect cultural heritage and ecological environment, integrate them into the tourism landscape design, display local characteristics and historical and cultural characteristics, and improve the sense of participation and experience of tourists. In this study, we first use CAD technology to complete the initial modelling of tourism landscape planning. In three-dimensional modelling, various parameters in landscape planning have an impact on the modelling accuracy. In order to realize the automatic generation of tourism landscape planning, we add a deep learning algorithm to optimize it. In order to further verify the CAD system optimized by deep learning, the application effect in tourism landscape planning is reliable. We compared the algorithms before and after optimization in terms of the accuracy of landscape planning image generation, as shown in Figure 5.

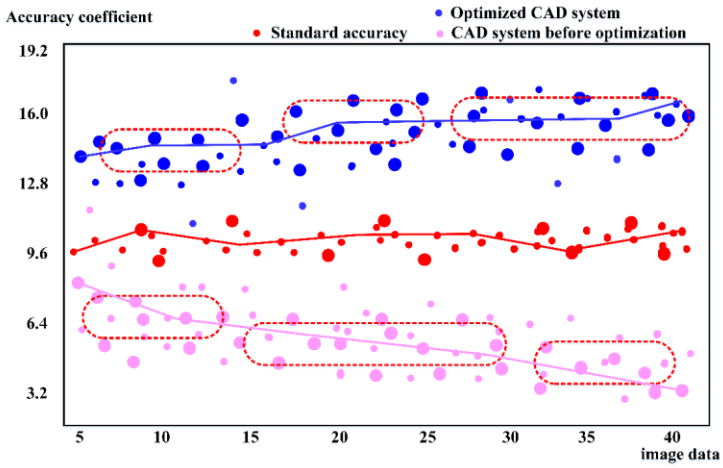

Figure 5: Comparison of accuracy in landscape planning image generation between algorithms before and after optimization.

As can be seen from Figure 5, it can be seen through the discrete changes of the data. The optimized CAD system has high accuracy in image generation for tourism landscape planning and layout. At the same time, in the system, we also add field landscape planning shooting data to improve the diversity and richness of landscape planning layout schemes and add comprehensive data to deep learning algorithm training and recognition to improve algorithm applicability. In the early stage, in order to

make the landscape planning more realistic, we also added tourists' suggestions on the layout of the tourism landscape. Therefore, in the collection and construction of the deep learning algorithm, landscape planning schemes that meet the needs of the masses will be preferentially selected. Compared with the actual application effect of CAD tourism landscape planning system before and after deep learning optimization, the changes in people's satisfaction are shown in Figure 6:

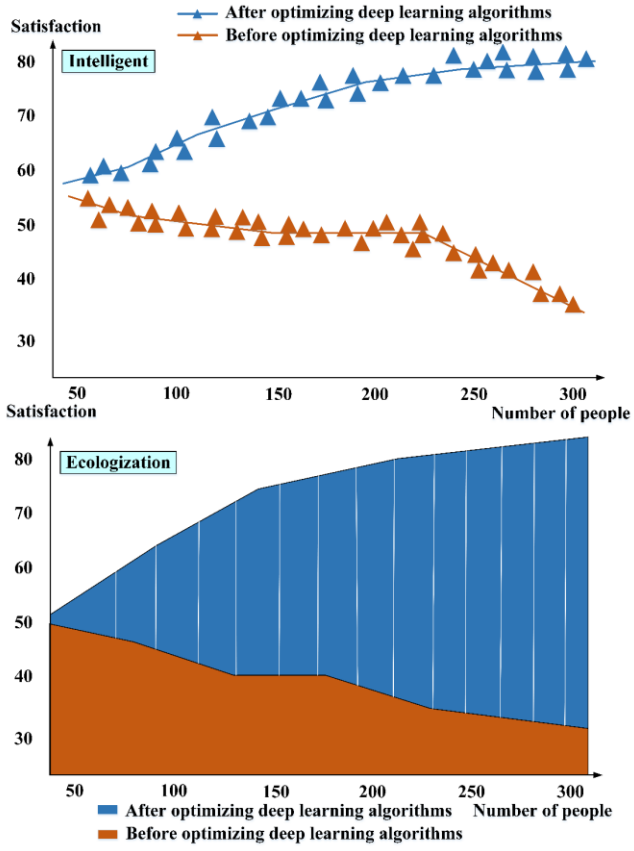

Figure 6: Changes in public satisfaction with the actual application effect of CAD tourism landscape planning system before and after optimization.

As can be seen from Figure 6, the satisfaction survey is divided into two kinds of evaluation results: intelligent and ecological. In application, the optimized CAD tourism landscape planning system can meet the needs of the people for the intelligent and ecological landscape layout, and the satisfaction coefficient is high. It can be seen that the tourism landscape planning and layout should be combined with the diverse requirements of the tourist masses, and the planning and design scheme should be dynamically adjusted from the terrain and cultural characteristics of the tourism region.

5 CONCLUSIONS

With the continuous development of computer and artificial intelligence technology, tourism and landscape planning and design have also undergone corresponding changes. The use of intelligent means to complete the layout adjustment of the tourism landscape with the aid of more scientific and accurate design can meet the diversified needs of tourists for tourism areas, and also meet the living environment requirements of the people around the tourism landscape area. This paper optimizes

CAD technology under a deep learning algorithm to study the application of tourism landscape planning. Firstly, CAD technology is used to complete the tourism landscape image processing, and the landscape elements and texture pattern features are extracted. The CAD drawing tool is used to complete the three-dimensional modelling of the tourism landscape layout, which accelerates the preliminary scheme design and the display of the later results. In the 3D model, the CAD tool is used to render the scene and optimize the collocation ratio of different landscape elements. Finally, a deep learning algorithm is used to optimize the CAD planning and design system to improve the model's performance in data recognition, extraction, and rendering accuracy. The requirements of tourists and other people on tourism landscape planning are added into the CAD system as adjustment parameters to realize the personalized and comprehensive design of landscape planning and layout. The research results show that using deep learning algorithms to optimize CAD tourism landscape planning systems can improve the three-dimensional display of landscape modeling in practical application and also improve the tourist and residential experience of the masses.

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