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Digital Art-Based Construction Strategy for Culturally Enriched Scenic Environments

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Abstract. The cultural scenery is also a product of the dynamic development of urban civilization, which is second only to the artistic creation of human language, which, like language and writing, has its own unique way of expression in each area, is a unique existence, and it is the precipitation of natural features and historical culture.Human scenery design has existed since ancient times, but with the development of computer technology, AutoCAD, Photoshop and other drawing software have been developed, which makes the design of human scenery systematic, comprehensive, true, reasonable, beautiful, accurate, efficient and easy to modify. As a technology of digital visualizing hearing, digital visualization has always played an important role in all kinds of popular media playing software. The real-time rendering, natural effect simulation and computational complexity involved in it are the research hotspots of computer graphics and multimedia. This paper puts forward an optimization design scheme of human scenery environment construction based on digital visual art design, carries out human scenery optimization design, urban ecological scenery information fusion perception and block area template matching in the process of image digital visual reconstruction, realizes urban ecological human scenery design, and finally carries out simulation test and analysis. Put forward the human scenery planning, analyze the regional spatial environment of human scenery planning by using computer computing, graphic ability and digital visualization technology, and rationally construct objective and rigorous design logic, so that the human scenery has scientific, artistic and social values.

Keywords:digital visualization; places of historic figures and cultural heritage; Digital Art-Based Construction Strategy
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1 INTRODUCTION

Culture is the sum total of civilizations created in the process of human practical activities. scenery is the object of human dreams and the projection of human culture on the earth. Culture reflects through the scenery and changes the scenery [7]. To endow the soul of culture with scenery design, it is necessary to make rational use of scenery elements, and form cultural scenery through

environmental aesthetics and cultural relevance[10]. The essential significance of cultural expression of scenery design lies in the shaping of atmosphere. Its subtlety is not how to decorate a "body" beautifully, but how to inject soul into the body[12].The purpose of culturalscenery design research is not only to protect the technical form, but also to think from the perspective of humanism, emphasize cultural care, and meet the needs of people's historical emotions and life interests[2]. In modern times, the cultural scenery, in turn, as a cultural heritage that can attract foreign investors and tourists, is an excellent opportunity to increase the visibility of the city and create economic effects for the city. Different cities show the unique customs and customs of different nationalities and different regions, and the changes in the social change environment also help human beings to reflect on whether their transformation of the environment is correct, it is a rare reference resource, and now it has become a unique cultural feature, but also a way to improve the quality of local life.Combining tradition with modernity, this paper puts forward the construction ideas of culturalscenery from the perspective of historical context, ecological information and cultural environment.the digital art installations that allow visitors to engage with and learn about the cultural and environmental significance of the site.

With the development of information technology and electronic technology, the popularity of mobile terminal equipment has been quite high. From text to image, to dynamic graphics and multimedia video, users receive a large amount of digital visual image information from various mobile terminals every day[4]. The persistence of human scenery images makes the digital visualization works real-time when users interact, and creates a virtual environment by processing and computing with the help of computer systems. With the development of technology, computers can simulate rich special effects, such as simulating natural environments such as weather, rain and snow, water flow, mountains, flowers and trees, etc; Or lifelike 3D reshaped people or objects, coupled with the digital visual cooperation of musical notes, pitches and lengths, form the corresponding action changes of roles triggered by specific musical characteristics, so that the aesthetic feeling of images can be reflected through the combination of vision and listening, vividly express the emotion of images, and let users integrate into the works more truly[9].As a new digital visualization technology, digital visualization has had an important impact on various popular media playing software. The technologies involved in feature extraction, image processing, virtual reality and so on are the hot spots of multimedia research[14]. In view of the advantages of digital visualization, images information itself has dynamic attributes that change over time. Based on the combination of information digital visualization and dynamic design, this paper discusses and studies the digital visualization methods and Strategies of images information with mobile terminals as the carrier, so as to better improve the creativity of human scenery construction.

The development of cities is not only the rapid development of materials, but also needs the drive of spiritual culture. To a certain extent, the inheritance of culture needs materials as the carrier. The two complement each other[16]. Cultural scenery, also known as cultural scenery, is a scenery picture formed by superimposing history and culture and local customs on the basis of natural scenery, which is related to human social activities[8]. It can meet some spiritual needs and material needs. It is a comprehensive product of social forms and artistic culture, with a certain brand of historical artistic aesthetic standards in the formation period. The urban area carries many elements such as history, culture, architecture, scenery, urban life, local customs, etc., and its environmental style reflects historical and cultural values and reflects the context of historical development[3]. Every city has a unique existence, so the development of human scenery design should conform to the context, which has certain particularity and complexity[6]. In the era of digital visual industry, how to use design methods to make more forms of information materials appear in digital visual form, and how to use existing technology and design means to meet the current social needs is an important research topic. This paper establishes the strategy of human scenery environment construction based on digital visual art design, carries out urban ecological scenery information fusion perception and block regional template matching in the process of human scenery image

digital visual reconstruction, and extracts the fuzzy feature quantity of human scenery ecological construction and spatial pattern optimization design image. Its innovation lies in:

This paper adopts the method of individual evaluation function in digital visualization in order to reduce the execution cost of the algorithm.

This paper studies the optimization design of cultural scenery environment construction of digital visual art design, and the structure is as follows:

The first chapter is the introduction. This part mainly expounds the research background and significance of human scenery optimization, and puts forward the research purpose, methods and innovation of this paper. The second chapter mainly summarizes the relevant literature, summarizes its advantages and disadvantages, and puts forward the research ideas of this paper. The third chapter is the method part, which focuses on the combination of digital visualization and neural network optimization design method. The fourth chapter is the experimental analysis. In this part, experimental verification is carried out on the data set to analyze the performance of the model. Chapter five, conclusion and outlook. This part mainly reviews the main contents and results of this study, summarizes the research conclusions and points out the direction of further research.

2 RELATED WORK

The dynamic development of human scenery is carried out under two factors, namely, the ecological form derived from natural ecological factors and the cultural form under the action of human factors.Although people have both social and natural attributes, the most fundamental characteristic is sociality. Therefore, the dynamic development of scenery under the joint action of natural ecosystem and human value system is under the intervention of human social survival activities[18].

Berghe h, gheyle W, stichelbaut B call human scenerys historical scenerys. For understanding the culture of scenery, it puts forward the theory of classifying land, roads, cities, rural areas and other regions in order to analyze their distribution, interconnection and historical origin, and points out the close relationship between human scenery and history[5]. Yang t et al. Proposed the difference between cultural scenery and natural scenery, and believed that cultural scenery can be divided into dynamic and non dynamic forms, and dynamic forms refer to people and substances moving with people; The latter refers to the non dynamic environment that culture attaches to the scenery, such as roads and their forms. It is believed that as the continuation of natural scenery, cultural scenery should be studied as a phenomenon evolved from natural scenery[21]. Wroblewski m proposed the characteristics of small and medium-sized cultural scenerys in cities, including regionality, independence, culture and artistry. It is pointed out that the urban small and medium-sized cultural scenery has regional characteristics first, and then independent characteristics. Like other environments, the urban small and medium-sized cultural scenery is also a space composed of various environmental facilities, which itself has certain functional attributes and serves urban residents. Secondly, as an urban scenery environment, artistic characteristics are artistic in themselves. Through modeling, texture, texture, color and other elements to express some emotion to people, and reflect the unique social culture, regionalism and folk characteristics of the city. Cultural characteristics refer to the small and medium-sized cultural scenery of the city, which has both natural and social attributes, and is a reflection of a certain social culture[20]. Montealegre believes that the cultural factors and historical characteristics people perceive in the scenery are a major factor that makes them feel happy. This concept transforms the concepts of "culture" and "scenery" from the place to the level of consciousness, and this statement is widely recognized[13]. Zhou t et al. Proposed to improve the context coordination between new and old buildings by directly representing the elements of the surrounding environment in duplicate or new forms[22]. In response to this phenomenon, mamvura Z should follow an open idea, strengthen local human and natural characteristics, and learn from foreign scenery gardening techniques to combine the two for

adaptation and sublimation. In the construction process, we should coordinate natural, ecological, cultural and other factors, pay attention to the diversity and polysemy of scenery construction, grasp the scale space of scenery structure, and seek development in inheritance and absorption[11]. Natalia mart í Nez tag ü EA systematically analyzes the gradual process of the transition from natural beauty to ancient urban aesthetics and the final formation of modern urban aesthetics, and focuses on the artistic conception of urban aesthetics and scenery design, as well as the cultural characteristic factors, artistic standards, signs and characteristics of urban aesthetics[15]. Ord ó EZ Barona and others, based on the perspective of mass aesthetics, believe that urban space is not just a simple art, but a living environment closely related to people's lives. Through three parts, this paper expounds the relationship between urban space and aesthetic law respectively, reflects the beauty of the city in the eyes of the public through social investigation, and summarizes the urban space with personality charm and urban vitality in line with sustainable development according to the investigation[17]. Agadjanian a discusses the importance and variability of the appearance of towns from a unique perspective and the concept of urban planning, and believes that the regional culture of towns plays an important role in the formation of urban images and forms[1]. Thiele J and others believe that "the sense of identity and belonging to a place, to some extent, can be said that the spirit of place can reflect regional culture[19]."

3 METHODOLOGY

3.1 Systematic Construction of Human Scenery by Using Digital Visualization

This paper will build a digital visualization system around the human scenery, which can be used for human scenery analysis and digital visualization. Through the real-time voice and processing input of human sceneryimages, through processing, analysis, and finally mapped to the virtual role. The system takes the sound as the input parameter, extracts the relevant images features through processing, and then carries on the emotion detection processing, real-time uses the facial expression and movement changes of the virtual character, and the transformation of the virtual scene to express the emotional factors, and finally displays them through the large screen. The system processing flow is shown in Figure 1.

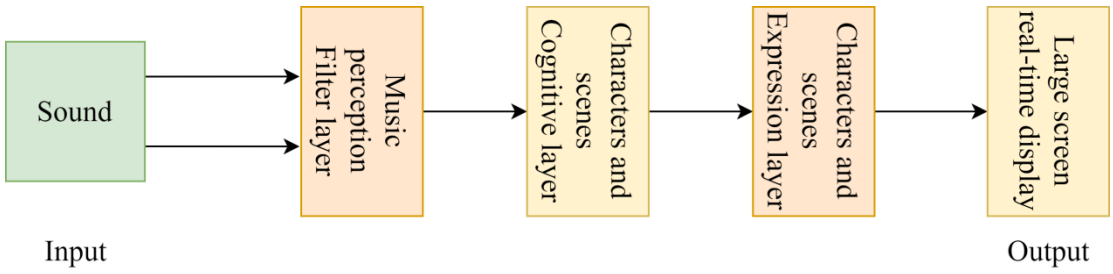

Figure 1: Flow Chart of Live Digital Visualization System.

Because images art has time variability, and images works need to rely on a certain length of time to express perfect ideas and content, as a digital visual design of images that complements images expression, it is best to show dynamic formal characteristics. On the one hand, dynamic graphics can correspond to the temporal variability of images; On the other hand, the digital visual graphics with changes are suitable for playing for a long time, which is not easy to make the viewer's digital visual senses feel boring and tired during the continuous images duration. In dynamic graphic design, the elements of a work are divided into three levels: digital visual monomer elements, digital visual space structure and digital visual dynamic movement. As shown in Figure 2.

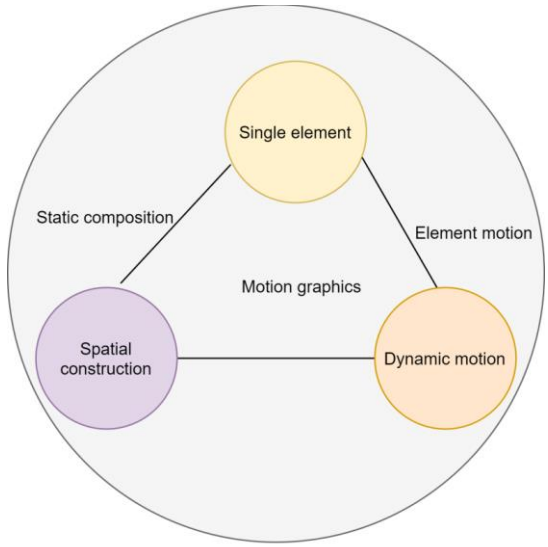

Figure 2: Design Elements of Dynamic Graphics.

The system architecture of the human scenery planning system adopts digital visualization technology, and the planned human scenery adopts parameterization. The human scenery planning process of the design is shown in Figure 3.

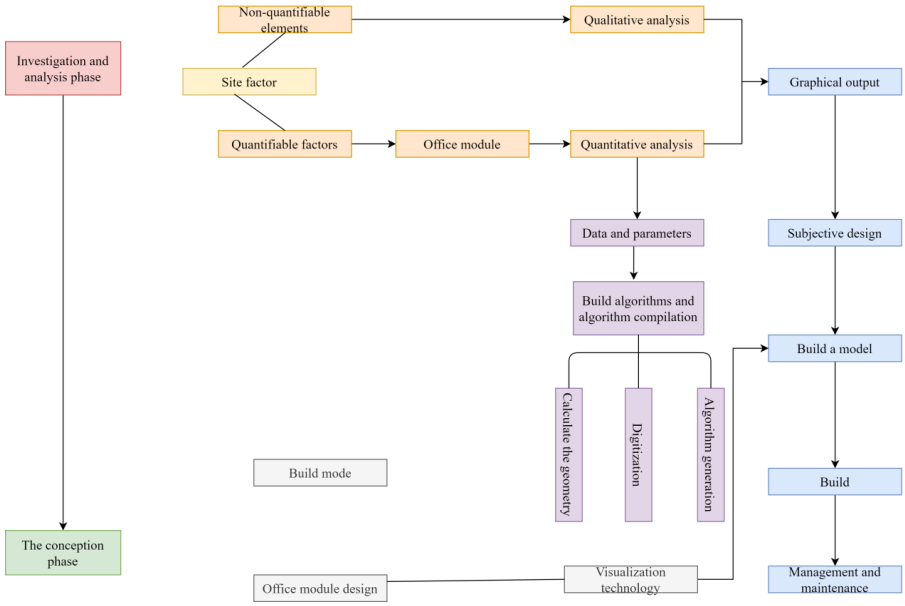

Figure 3: Human Scenery Planning Process.

The human scenery planning process in Figure 3 is to analyze the quantitative factors and non quantifiable factors according to the human scenery site, store the data of the two factors into the system database, generate the human scenery quantitative data algorithm through the office module of the system, and output the human scenery graphics. Using digital visualization technology and

culturalscenery graphics, build a culturalscenery model and complete the culturalscenery planning. At this time, the next step of construction, management and maintenance can be carried out for the planned cultural scenery. This time, the human scenery planning system is designed to determine the overall architecture of the system, determine the system network topology according to the architecture, ensure the safety and speed of the system network operation, establish a system database, and store human scenery data. The design of human scenery planning system is completed by converting the designed human scenery planning process into system operation code and storing it in the system server chip.

3.2 Using Data Digital Visualization to Screen Human Scenery Data

Compared with conventional digital visual information sources, images information has two basic characteristics - non digital visualization and non semantics. The meaning of non digital visualization is that images information itself does not have any digital visual image and digital visual level information, and it is a set of information transmitted purely by hearing.At this time, dynamic interaction is needed to help users' feedback after the construction of cultural scenery. Dynamic interaction is relative to static interaction. Dynamic interaction is not only the application of dynamic graphic effects, but also a form of feedback and expression in the process of human-computer interaction. This form is widely used because of its significant advantages. First, the dynamic form is easier to attract users' attention, which can naturally guide users to flow their eyes with dynamic graphics; Second, dynamic interaction can make the changes of element pages more natural and smooth, in line with people's psychological cognition, and more dynamic and instant. Generally speaking, the data digital visualization process includes data collection, data filtering, classification mapping, rendering and synthesis, and user interaction, as shown in Figure 4.

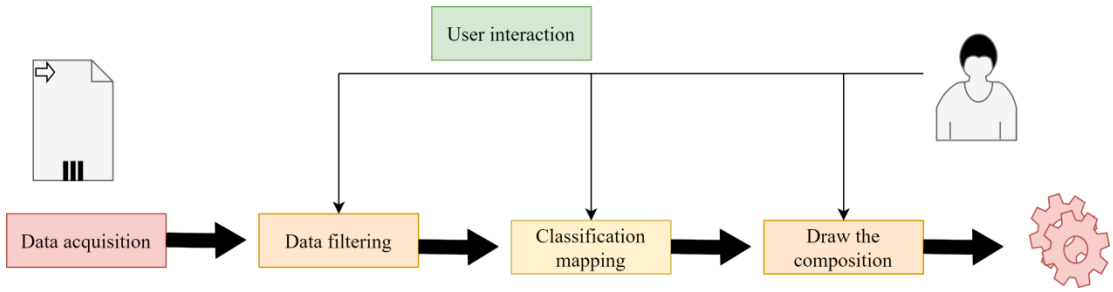

Figure 4: Data Digital Visualization Process.

Firstly, for each model 1, the standard Kalman filtering algorithm is used to obtain the estimated value of the target state based on this model; Secondly, the final target estimation is obtained by weighting the estimated value of each model with model probability.

1. Model probability prediction

$$\mu(i,k+1|k)=P\{M(k+1)=i|Z_k\}=\sum_{i=1}^{N_1}\pi_{li}\mu(l,k|k) \tag{1}$$

Where $Z_k=\{Z(l)\}_{l=1}^{k}$ represents the cumulative measurement set up to time k, and the model is switched directly based on a Markov chain, that is, $\pi_{li}=P\{M(k+1)=l|M(k)=i\},i,l=1,2,...,N_1$.

2. Calculation of mixed initial conditions

The initial mixing condition of the i model is

$$X_0(i,k|k) = \sum_{l=1}^{N_1} \pi_{li} \frac{\mu(l,k|k)}{\mu(l,k+1|k)} X(l,k|k) \quad , \tag{2}$$

$$P_0(i,k|k) = \sum_{l=1}^{N_1} \pi_{li} \frac{\mu(l,k|k)}{\mu(l,k+1|k)} P(l,k|k) + \left\{ X(1,k|k) - X_0(l,k|k) \right] \left[X(1,k|k) - X_0(l,k|k) \right]^T \} \tag{3}$$

Where $X(l,k|k),\ P(l,k|k)$ is the optimal estimate and error variance matrix of Model l at time k .

3. State prediction and observation prediction

The state prediction of the j sensor based on the i model is estimated as

$$X^j(i,k+1\ |k) = A(i,k) X_0^j(i,k\ |k) \tag{4}$$

$$P^j(i,k+1\ |k) = A(i,k) P_0^j(i,k\ |k) A^T(i,k) + Q_j(i,k) \tag{5}$$

The observation prediction based on the i model is

$$Z^j(i,k+1\ |k) = C^j(k) X^j(i,k+1|k) \tag{6}$$

When the observation value at time $k+1$ arrives, $X^j(i,k+1|k)$ is updated with standard Kalman filter to obtain the state estimation value based on Model i

$$X^j(i,k+1\ |k+1) = X^j(i,k+1|k) + K^j(i,k+1|k)\left[Z^j(i,k+1) - z^j(i,k+1|k) \right] \tag{7}$$

And error variance matrix

$$P^j(i,k+1\ |k+1) = [1 - K^j(i,k+1) C^j(k)] P^j(i,k+1\ |k) \tag{8}$$

Where the optimal gain matrix

$$K^j(i,k+1)=P^j(i,k+1|k)\left[C^j(k)\right]^T\left\{C^j(k)P^j(i,k+1|k)\left[C^j(k)\right]^T+R^j(i,k)\right\}^{-1} \quad (9)$$

4. Model probability update

$$\mu(i,k+1|k+1)=\frac{1}{c}\wedge(k)\sum_{i=1}^{N_1}\pi_{li}\mu_l(k|k) \quad (10)$$

Where $\wedge(k)$ is the likelihood coefficient of the sensor and C is the normalization factor.

4 RESULTANALYSIS AND DISCUSSION

Later, in order to verify the performance and ease of use of the system developed in this paper, the main models in the fields of computer vision and natural language processing are used.Suppose there is a function f, we want to find a value χ, so that $f(x)=b$. If x_0 is an estimated value of χ, then the residual is $b-f(x_0)$ and the error is $x-x_0$. It can be seen that even if χ is unknown, we can still calculate the residual, but we cannot calculate the error. As shown in Figure 5 and Figure 6, the traditional neural network does not have the better effect with the deeper depth, and even its performance in the training set will deteriorate with the increase of network layers, which is the so-called degradation problem in the construction of human scenery.

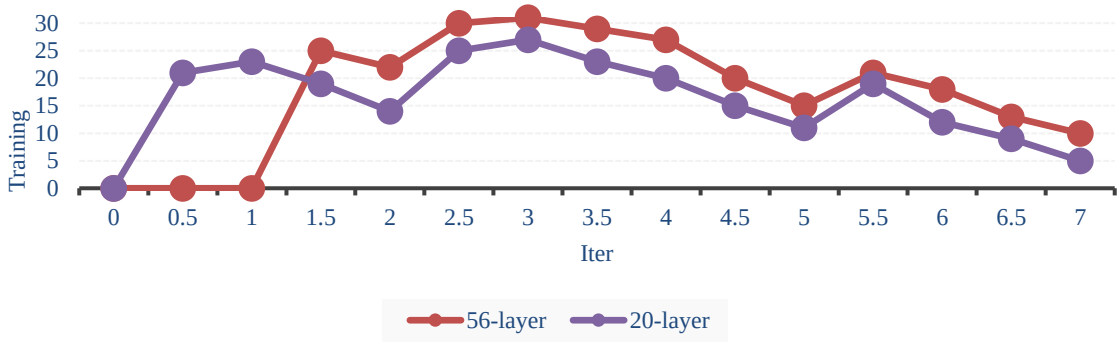

Figure 5: Training Errors of Neural Networks with Different Depths.

In our research, we found that the accuracy of prediction results is affected by many factors. For example, different prediction methods; The number of similar neighbors selected in the prediction process; And the proportion of test sets in the data set. For hybrid collaborative filtering algorithm, the influence factor parameter is also one of the factors that affect the prediction accuracy.

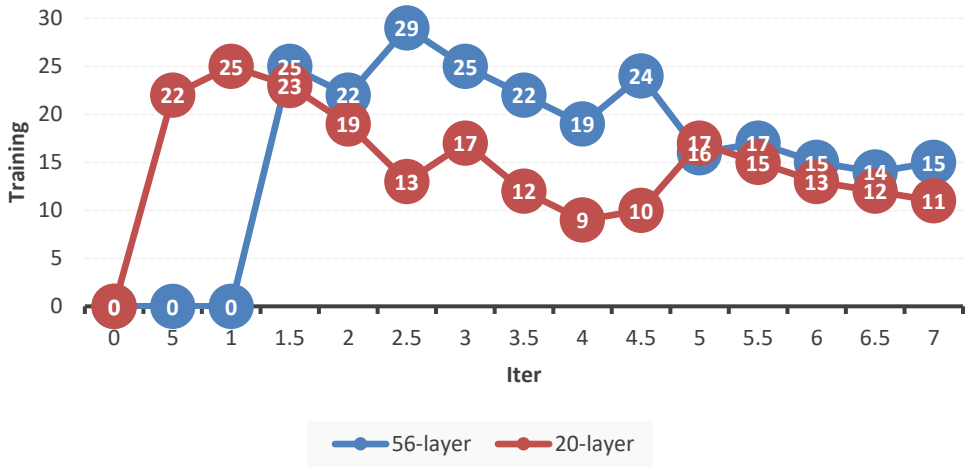

Figure 6: Test Errors of Neural Networks With Different Depths.

This paper carries out simulation verification on MATLAB platform. The control variable method is used to detect the influence of various factors in each method. We use several experiments to test the influence of these factors on the prediction accuracy one by one. In order to detect the influence of the number of nearest neighbors, we keep other factors unchanged. The same data set (training set and test set) is used as input for these three methods, and the final results are shown in Figure 7 below.

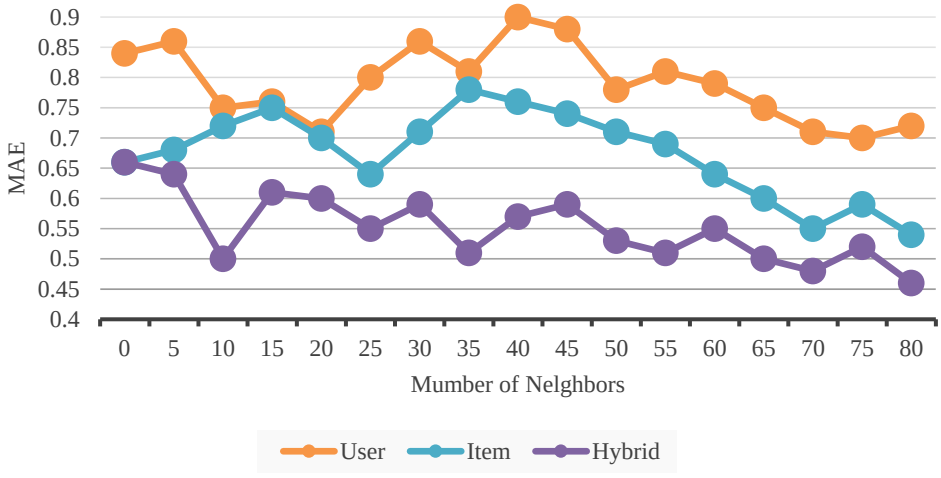

Figure 7: the influence of MAE of the three methods with the number of nearest neighbors.

In Figure 7 above, the green broken line represents the curve of the predicted score MAE value obtained by the user based collaborative filtering method with the number of nearest neighbors. The blue broken line represents the curve of the MAE value of the predicted score value based on the project with the number of nearest neighbors. The yellow broken line represents the curve of MAE of the score predicted by the new hybrid collaborative filtering algorithm proposed in this paper with

the number of nearest neighbors. It can be seen from the results above that the MAE value of this new hybrid collaborative filtering algorithm is generally small, and its overall MAE gradually decreases with the increase of the number of nearest neighbors, that is, the closer the predicted score value is to the real value, the higher the accuracy of the prediction result.

In this experiment, we keep the number of nearest neighbors unchanged and change the proportion of test sets input in the experiment, which are 20%, 25%, 30%, 35% and 40% respectively. Then we get the results of these three methods, as shown in Figure 8 below:

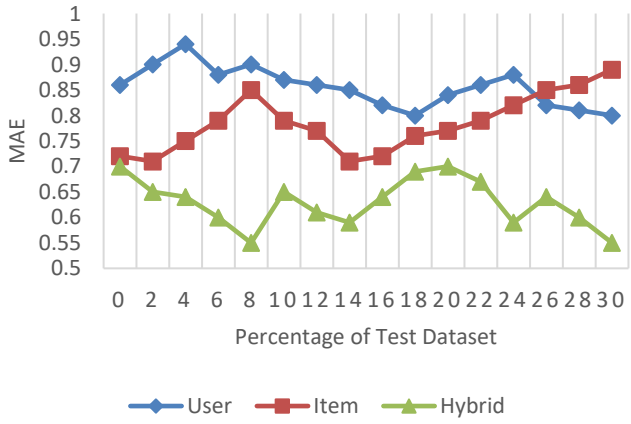

Figure 8: The Influence of MAE of Three Methods With The Proportion of Test Set.

In Figure 8 above, the blue broken line represents the curve of the predicted score MAE value obtained by the user based collaborative filtering method with the proportion of the test set. The orange broken line represents the curve of the MAE value of the predicted score value based on the project with the proportion of the test set. The grey broken line represents the curve of MAE of the score predicted by the new hybrid collaborative filtering algorithm proposed in this paper with the proportion of the test set. It can be seen from the above results that the MAE value of this new hybrid collaborative filtering algorithm is generally lower than that of the other two methods, and its overall transformation with the proportion of the test set is non monotonic. For this new hybrid collaborative filtering algorithm, when the test set accounts for 18%, the MAE is the smallest, that is, the predicted score value is closest to the real value, which means that the accuracy of the prediction result is the highest.

According to the functional modules of the above system, three groups of experiments are carried out, and the system test cases are designed to detect the operation function of the system. From the four aspects of user management, database, system maintenance and planning and design, the following cases are designed: ⊖ when adding user information, do not fill in the required items, and whether the prompt box will pop up; ⊜ Whether there is a prompt box when deleting or modifying user information; ⊛ Whether there is backup in the system after accidental deletion of data information; ④ Search the data in the database, and whether the retrieved content is consistent with the retrieved content; ⑤ Whether there is security authentication when changing user settings; ⑥ Connect the printer, whether you can print data information and pop up verification; ⑦ Whether there is a prompt box for changing, deleting and adding drawings; ⑧ Retrieve the construction drawings and check whether the construction drawings are classified according to the project category. According to the five cases designed

above, verify whether the system functions meet the expected results and whether there are leftover problems during operation. The experimental results are shown in Table 1.

Case		*Expected results*	*Test result*	*Remaining problems*
A system	*1*	*Pop up prompt box*	*Adopt*	*Nothing*
	2	*Pop up prompt box*	*Adopt*	*Nothing*
	3	*Data backup exists*	*Adopt*	*Nothing*
	4	*Consistent content*	*Adopt*	*Nothing*
	5	*Pop up security verification message*	*Adopt*	*Nothing*
B system	*1*	*Pop up prompt box*	*Adopt*	*Nothing*
	2	*Pop up prompt box*	*Adopt*	*Nothing*
	3	*Data backup exists*	*Fail*	*Have*
	4	*Consistent content*	*Adopt*	*Nothing*
	5	*Pop up security verification message*	*Fail*	*Have*
C system	*1*	*Pop up prompt box*	*Adopt*	*Nothing*
	2	*Pop up prompt box*	*Adopt*	*Nothing*
	3	*Data backup exists*	*Fail*	*Have*
	4	*Consistent content*	*Fail*	*Have*
	5	*Pop up security verification message*	*Adopt*	*Nothing*

Table 1: System Function Test Results.

It can be seen from table 1 that both system B and system C have failed test cases, that is, the test results are inconsistent with the actual expectations, and there are still some remaining problems in the failed cases; All cases of system a passed without any remaining problems. It can be seen that the human scenery planning system designed this time has perfect functions.

According to the above experimental results, the second group of experiments was conducted to extract the accuracy of human scenery planning in the experiment. In order to ensure the rigor of the experiment, the accuracy of human scenery planning in the three groups of systems was checked 30 times, as shown in Figure 9.

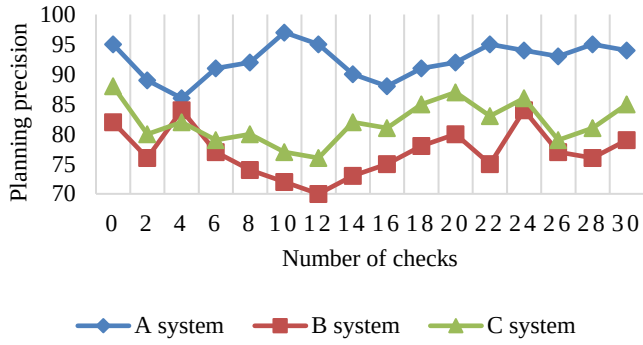

Figure 9: Accuracy of Cultural Scenery Planning.

As can be seen from Figure 9, the accuracy of human scenery planning of system B fluctuates as high as 14, and the highest accuracy is only 84%, and the planning accuracy is the lowest; Although the accuracy fluctuation of C system planning human scenery is small, the planning accuracy still

does not reach 90%; The accuracy of human scenery planning in system a not only has a small planning accuracy difference, but also has a minimum planning accuracy of 86% and a maximum planning accuracy of 97%. It can be seen that the human scenery regional planning system designed this time has high planning accuracy.

5 CONCLUSIONS

This paper puts forward an optimization design scheme of human scenery environment construction based on digital visual art design, carries out human scenery optimization design, urban ecological scenery information fusion perception and block area template matching in the process of image digital visual reconstruction, realizes urban ecological human scenery design, and finally carries out simulation test and analysis. This result fully shows that the prediction accuracy of the new images recommendation algorithm proposed in this topic is better than the other two algorithms. In the influence of the number of nearest neighbors, the more the number of nearest neighbors, the greater the degree of algorithm optimization. In the influence of the proportion of test sets, when the proportion of test sets is about 25%, the optimization degree of algorithm accuracy is the largest. As an emerging technology, digital visualization has the characteristics of high-end technology in modern society. It combines vision and hearing as a new generation of artistic language, and brings new perceptual experience to the public. Although there are still many problems, with the development of science and technology, the connotation of digital visualization will be richer.

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