www.cadanda.com
Computer-Aided Design AND APPLICATIONS

Design of 5G+VR Environment Simulation Tourism System Based on CAD Technology

Lu Liu[1], Jinxia Wang[2] and Ping Zou[3,*]

[1]Department of Art and Design, Shaanxi Fashion Engineering University, Xi'an 710000, China, l826591@126.com
[2]Department of Art and Design, Shaanxi Fashion Engineering University, Xi'an 710000, China, W15202422172@126.com
[3]Department of Student Affairs, Hebei Normal University of Science and Technology, Qinhuangdao 066000, China, zp3769@hevttc.edu.cn

Corresponding author: Ping Zou, zp3769@hevttc.edu.cn

Abstract. As the internet age is gaining pace, not only has the speed of the network changed, but also the variety of network products that have been created. It continues to enrich people's daily life and also brings convenience to life, turning the impossible into possible. People can experience tourist attractions without leaving home through fifth-generation mobile communication technology combined with virtual reality technology 5G + VR in an environment that combines computer-aided design CAD technology. The real simulation of tourism systems is not an easy thing to achieve, in the process of experimentation and design not only need a lot of theory, but also the relevant researchers constantly repeated experimental operation and practice of information, in order to really study the practical system. Nowadays, CAD technology combined with 5G+VR environment has become a hot research area for researchers. Travel is one of the most popular recreational activities in modern times, but people are often confused in choosing places to visit and routes to travel. Based on the above, this paper builds a simulated tourism system based on CAD technology combined with a 5G+VR environment. The development direction of CAD technology in various countries and the current social status of 5G network and VR are discussed first. The model of a sample tourist attraction is analyzed and stored by means of an environmental simulation system with CAD technology. The internal optimization of the environmental simulation system is also investigated, incorporating the theory of injection-wave interaction and the theory of charge action. The results of the study show that the 5G+VR environmental simulation tourism system based on CAD technology has good practical effects in real-life applications after optimization.

Keywords: CAD technology, travel environment systems, injection wave interactions, charge fields, inverse wave oscillations.
DOI: https://doi.org/10.14733/cadaps.2023.S8.66-77

1 INTRODUCTION

Today's times are developing rapidly and intelligence and convenience are appearing more and more frequently in life. CAD technology is constantly being updated, and the process of updating and researching CAD technology often results in poor applications in the field. The use of CAD technology for system stability research has therefore been a major area of research for those involved [1]. As the tourism environment simulation system studied in this paper itself requires the construction of a complete model system, which is then used in conjunction with an intelligent network. Therefore, the 5G+VR environment simulation tourism system with CAD technology needs to be more stable and superior to the data transmission than the normal tourism model. In the case of tourism model systems, the analysis and transmission of data models is often confusing and the transmission fails, and the network fluctuates dramatically, affecting the transmission and analysis of the model system [2]. Therefore, we cannot simply build a framework for the tourism simulation system, but also need to take into account factors such as the overall system application performance and the ability to maintain the correct analysis of the model. Therefore, during the construction of the 5G+VR environment simulation tourism system with CAD technology, various error factors have to be considered to maximize the performance optimization of the overall tourism simulation system.

In order to make the environmental simulation tourism system work better and to adapt it to the tourism industry, problems need to be identified and solved in time. The problems within the designed tourism system are then investigated in a holistic and specific manner. As CAD technology continues to develop, there are a variety of systems based on this technology. In the beginning there was no CAD technology, only the internet and no artificial intelligence. It was only with the development of information technology that we entered the information age and a whole range of new technologies emerged to facilitate human life. The main reason for using CAD technology is to be able to analyze and transmit model data better and faster, and to carry out a fine analysis of the data with all the information collected during the work of the model system. The information is then further processed through various theories and algorithms supported within the model system to obtain a picture presentation of the AR end [3]. The main objective of the environmental simulation tourism system during its operation is to improve the resolution of the processing of objects. At the level of the construction of the tourism system, the main objective is to optimize its internal framework, add the corresponding theoretical formulas and algorithms and improve the stability of the tourism system. This paper is about the construction of a 5G+VR environment simulation tourism system based on CAD technology. Compared to ordinary VR environment simulation systems, the CAD technology CIA environment simulation tourism system that we have studied maximizes the ability and speed of the system to analyze things. From the above, it is clear that the research on the design of a 5G+VR environment simulation tourism system based on CAD technology has superior application prospects in the practical field. In this paper, an optimization study of the simulated tourism system is carried out by using the CAD technology approach and combining the 5G+VR environment and related functions [4].

2 CURRENT DEVELOPMENT OF CAD TECHNOLOGY IN VARIOUS COUNTRIES

As artificial intelligence has matured, there has been a shift in the industrial sector from human drawing and design to the use of CAD technology to simplify work. Nowadays, CAD technology is being used in a wide range of industries, and more and more variations of CAD technology are being developed. This paper examines the incorporation of CAD technology into a 5G+VR environment to design a tourism system. The use of CAD technology for system optimization and the incorporation of wave-injection interactions within the tourism simulation allows for more accurate data processing and better data retention. By ensuring the correct processing of the sample data within the simulated tourism system, the overall system can be optimized to improve the effectiveness of its use and the convenience of human life. Only if the simulated tourism

system is free from obvious errors and problems can the system be entered into proper operation [5]. However, CAD technology is added to different industry sectors and there are differences in the modelling requirements for the system. The 5G+VR environment simulation tourism system studied in this paper has been upgraded and optimized in terms of overall system performance when analyzing and processing models related to sample data. And how to be able to sustain a high analysis efficiency system operation is also the research challenge we face. Only through relentless efforts to experiment with the applicability of the relevant algorithms to the tourism system can we eventually achieve the maximum performance enhancement to the system.

In view of the shortcomings of sustainable tourism teaching simulation, McGrath et al. [6] introduced the design, development, testing and verification of destination development game simulation in detail, aiming to strengthen the teaching of sustainable tourism principles. We discussed two phases of model development, including early games developed using system dynamics and evolutionary versions with agent-based modeling extensions. It combines group leadership framework and network theory, which together provide a framework for considering human dynamics triggered by simulation interaction. Mikeska et al. [7] used an example of a performance task designed to measure teachers' ability to guide discussion focused discussions in basic science. To illustrate the coordinated, cumulative and dynamic nature of this structure, and to assess the challenges faced by designers in developing performance tasks to measure this structure. Previous studies on tourism land mainly focused on spatial distribution and its impact on the environment. Here, Shi et al. [8] proposed a simulation model of future mountain resort tourism land use based on cellular automata and Markov chain method. Without development restrictions, the growth of tourism land in the Reserve tends to increase, especially in the Eshan area. The simulation results can provide useful inspiration and guidance for regional tourism planning and management. The development of tourism is becoming more and more important, because tourism is an important part of each country's economic system. External factors have the greatest impact on the development of tourism: natural disasters, wars, economic crises and epidemics have destabilized the development of tourism around the world. In order to avoid or reduce the impact of negative phenomena on tourism in specific countries or regions, it is essential to predict the impact of external factors, determine the most important factors, and formulate strategic measures to turn threats into opportunities. In the context of solving the above problems, Shpak et al. [9] simulated the impact of external factors on the utilization level of tourism potential in the region. Xie et al. [10] provides a theoretical perspective on how modeling and simulation on CAD platform can be used to teach scientific concepts and inform design decisions. This paper discusses the educational significance of three recent advances in CAD technology: system integration, machine learning and computational design. The challenge of using solar energy to design energy-saving buildings is used as an engineering example to illustrate the learning and teaching opportunities created by the modeling, simulation and data mining capabilities of Energy3D software. Energy3D is a CAD tool developed from scratch to support engineering research and education.

3 RESEARCH ON THE DESIGN OF A 5G+VR ENVIRONMENT SIMULATION TOURISM SYSTEM BASED ON CAD TECHNOLOGY

3.1 Research on the Construction of A 5g+Vr Environment Simulation Tourism System Based on CAD Technology

In the process of building a 5G+VR environment simulation tourism system, it is of utmost importance that the system starts to operate with the correct information collection and data transmission and management of the thing model to be analyzed. In the implementation of a complete tourism simulation system, the main objective is to analyze the data from the model and to transfer the image information to the computer for imaging in the VR. In this process, the whole system needs to be given the ability to analyze the information within the simulation so that the overall system can accurately analyze and process the model. In a physical application, the model

is first analyzed and then the information fed back from the model is calculated and processed. Therefore, regardless of the state of operation of the tourism simulation system, we can only minimize errors and mistakes, we cannot make them disappear completely. As the system is different when analyzing and processing information, it requires a better analytical capability in the studied tourism simulation system. The system needs to assist each other in the process of connecting with 5G+VR to better transfer the complete information. The process of building one of the VR components, as shown in Figure 1.

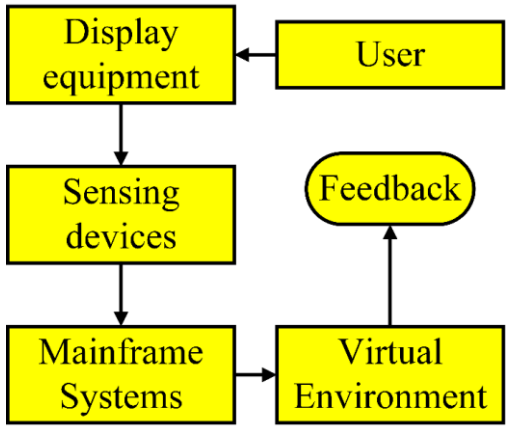

Figure 1: CAD combined with AR part of the build flow chart.

As can be seen from Figure 1, information transfer is an important part of the CAD technology combined with the 5G+VR environment simulation tourism system. The final model of the entire simulated tourism system cannot be separated from the mutual cooperation of the various links, and whether the model of things can all operate correctly for processing is entirely dependent on the normal state of the various links between the system. In order to coordinate the system, the following formula has been added.

$$\left(\frac{\partial}{\partial a}+\alpha_c\right)F_c=-k_{nc}I\sqrt{\frac{\mathrm{kz}_c^0}{2}}\left(\frac{v}{v_c}esp(-i\varphi)\right)esp(-i\eta_c) \tag{1}$$

$$\eta_c=\int_0^c k_{cn}dz'-\frac{\varpi_n}{v_0}z \tag{2}$$

From the above equation it is clear that by adding the excitation function equation to the wavelengths generated within the space, it is possible to maximize the mobilization factor of each link within the excitation simulation hair travel system. Then calculate the time required at the links of each link as well as the position difference can be achieved to mobilize each part to operate simultaneously. The equation of variation within the CAD technique is as follows.

$$\frac{d\gamma_k}{dz}=-\frac{\eta}{c^2}re[(E_{rj,c}+E_{rf,c}+E_{da,c})_k] \tag{3}$$

$$E_{rf,c}=\sum_n F_n e_2(n,c)\exp \tag{4}$$

As can be seen from the above equations, the simulated travel system is able to calculate in time the values for the changes that occur in the space charge field as well as the magnetic field when it is in operation. The wavelength data information obtained by the calculation is then used to calculate a suitable route for analyzing the information. One of the CAD models for the analysis of things, is shown in Figure 2.

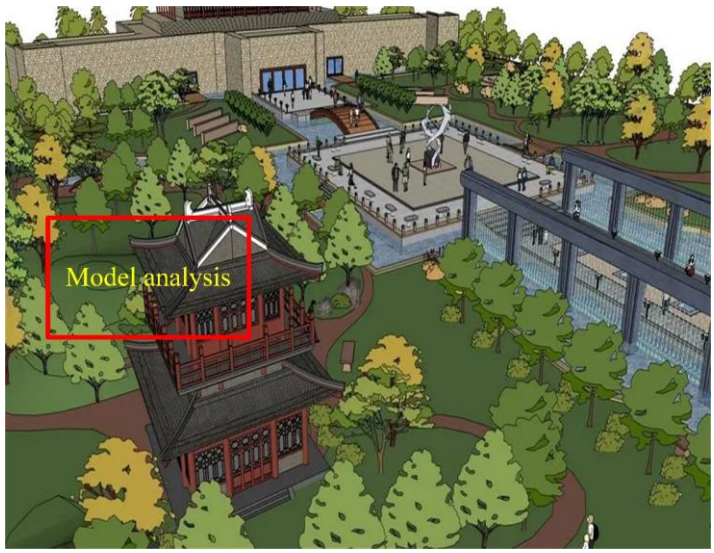

Figure 2: Imaging model diagram of specific things.

As can be seen in Figure 2, the sample thing models that are analyzed and processed by the simulated tourism system. It can be seen that the CAD system can quickly generate a thing model to be drawn automatically by analyzing the information. However, in addition to the coordination of the internal parts of the system is not enough, it is also necessary to consider the problem of errors and mistakes that can arise within the environmental simulation system. We have chosen to incorporate a conservation approach, with the relevant equations as follows.

$$\frac{dp'}{dt} = -wre[E + v + X] \tag{5}$$

$$\frac{d\lambda}{dt} = -\frac{q}{m_0 a^2} re[v, E] \tag{6}$$

By the inclusion of the above-mentioned conservation equation, the information from the data analyzed can be averaged within the simulated tourism system, and the relevant information obtained in the charge field can be operated in such a way that information fluctuations can be avoided. The information data is transferred to the internal CAD for processing until it is transmitted. If there are errors in the information analyzed during processing, the system can also make its own judgement on the information and discard it, before entering the information processing process. The error rate is reduced by adding a conservation formula to the system to reduce errors as described above. Next, we need to build the direction of propagation of the charge field within the CAD and need to calculate the specific propagation factor, the relevant formula is as follows.

$$E_s = E_w e^{j\phi} \tag{7}$$

The values of the propagation factors calculated by the above equations are in fact all factor quantities of the lowest charge field within CAD. In the CAD-supported 5G+VR environment simulation tourism system in operation, by calculating the amount of factors between individual things, it is possible to generate the distribution on the whole plane and the degree of variation. The changes generated are key to the errors that can be made to the CAD in the generation process, and to ensure the smooth conduct of the experimental research in this paper, we set a qualitative requirement within it to ensure that the information within the charge field will all spiral for analytical feedback, with the following formula.

$$k_h c \pm \psi = const \tag{8}$$

By adding the above formula, the 5G+VR environment simulation tourism system studied in this paper is able to iterate the sample of things analyzed, which can significantly reduce the chance of error. It is then through the direction that accurate values can be calculated. Continuous analytical research within the 5G+VR environmental simulation tourism system can lead to a unified model cognition, but what is studied in this paper is more applicable to intuitive research. Accurate calculation of the spatial field harmonics and direction of each thing model can better reflect the thing model to the AR side. Different scales of harmonic values can be used to determine different scales of wave amplitude between models, and can be adapted to the analysis of models in multiple scenarios.

The framework of the 5G+VR environment simulation tourism system under CAD technology is not a single object of analysis as the study itself requires a large number of things to be modelled for analysis. In the process of constructing the overall simulated tourism system, for the smoothness of subsequent experiments and applications, it is also necessary to add corresponding channels in the modelling that facilitate the flow of data information for the common transmission of multiple data, and the function of branching channels is added in this paper, with the relevant formulae as follows.

$$I_n = F^2 B_t \tag{9}$$

$$q_k = \frac{2\pi L_k}{\omega} \tag{10}$$

As can be seen from the above formula, the addition of branch channels in the internal modelling of the system and the connection between the various internal modules not only lays the foundation for the speed of data and information flow, but also facilitates the flow of data and query calls between the various module components. By setting a certain maximum amount of data to be passed inside the channels, the experimentation time is thus controlled when the CAD enters its working state. The experimental time is controlled, which also prevents the overall system from running for too long in the working state and the occurrence of problems with disorganized data information.

By the addition of the above formulae, the model of the 5G+VR environment simulation tourism system under CAD technology studied in this paper has been constructed. The system can be connected to 5G+VR and achieve the purpose of calling information and conveying information to each other with various other links. It is also possible to reduce some of the errors and to screen and discard invalid information data. The final change curve for the constructed 5G+VR environment simulating the transmission of the tourism system to the computer side is shown in Figure 3.

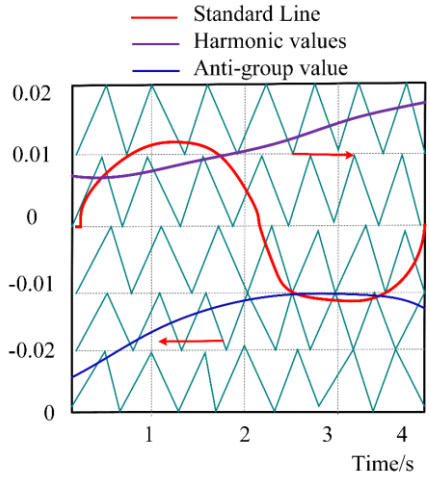

Figure 3: Harmonics and anti-group coefficient towards system data change graph.

As can be seen from Figure 3, the system performance of the constructed 5G+VR environment simulation tourism system tends to be smooth in the face of the sample models for analysis, with no large fluctuations occurring.

3.2 Optimization of a 5G+VR Environmental Simulation Tourism System Based on CAD Technology

The above has modelled the tourism system as a whole and the next step is to optimize the performance of the system in detail. Wave-injection interaction theory is abstract and can also be described as three-dimensional imaging. The theory is therefore ideally suited for application in the construction of the simulated tourism system studied in this paper. The algorithms of the theory allow for better imaging of things and the relevant equations are as follows.

$$R_{n'} = -\frac{i}{\pi\varepsilon_0\omega_0 b^2}\sum_{n'} R_{n'}[\frac{1}{n'}exp(-i\psi_{n'})]\exp(i\psi_{n'}) \tag{11}$$

$$\frac{d\psi_n}{dz} = \frac{\omega_n}{v_1} - \frac{\omega_n}{v_n} \tag{12}$$

$$R_{n'} = 1 + 3i_1(\kappa_n b)[K_0'(\kappa_n b) - \frac{K_0(\kappa_n a)}{I_0(\kappa_n b)}i(\kappa_n a)] \tag{13}$$

From the above equations, the parameters within the 3D model can be obtained for the wavelength motion along the path length of the thing model. The wave-injection interaction theory can be understood as a theoretical approach that emerged specifically to improve the performance of the system, and the corresponding parameter values can be automatically set according to the existing excitation equations. The excitation equations added in this paper are all non-linear in nature and the wave-injection interaction theory method used is also non-linear. The performance of the overall simulated tourism system on the computer side after the addition of the wave-injection interaction theory is shown in Figure 4.

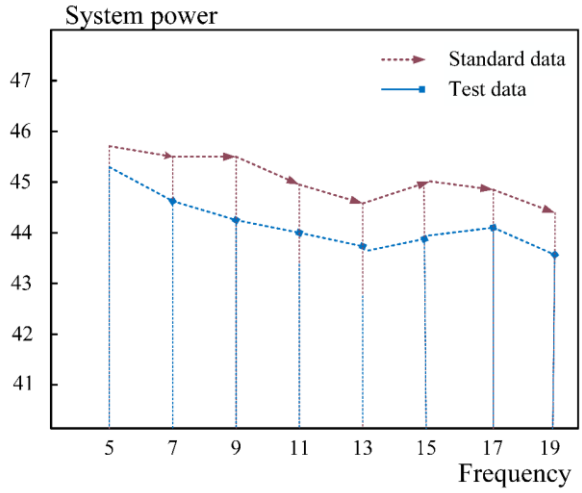

Figure 4: Plot of system performance data under wave-injection interaction.

As can be seen from Figure 4, the distance within the two different things models, the data responded to in the overall tourism system as time increases the frequency of the system mobilization rises proportionally, there is no sudden drop or sudden increase in frequency phenomenon. This phenomenon, too, can be verified side by side that the note wave interaction theory approach is well suited to the 5G+VR environment simulation tourism system studied in this paper. With accurate values and a stable system, the 3D model conveyed is able to give a better experience to the user.

The above-mentioned content optimizes both the imaging and the performance of the system by adding wave-injection interaction theory to the simulated tourism system constructed. In addition, this aspect of the charge field needs to be taken into account and the algorithm needs to be upgraded. As CAD is subject to excessive information coefficients in the input and output information and excessive coupling coefficients between the wave reflections, a non-linear theoretical approach incorporating inverse oscillations has been chosen to address these problems. The functional equation associated with it is as follows.

$$(\frac{\partial}{\partial_z} \pm \alpha_n) F_n^{\pm} = \mp I e_2^{\mp}(n,z) \left\langle exp(-i\psi_n) \right\rangle_K \tag{14}$$

$$Tl = 15 \log |s_{21}| (\mathrm{db}) \tag{15}$$

With the above equation, the direction of the wave can be analyzed in the excitation equation of the charge field for the wavelength of the reflection, and the presence of anomalies in the correlation coefficients and loss parameters can be calculated, which in turn transmits the information to the system, which then makes the final decision. With the addition of the above theoretical algorithms, the overall 5G+VR environmental simulation tourism system with CAD technology is optimized. In order to see if the optimized simulated tourism system can correctly handle oversized coefficients, fixed values were explored and the results were reflected as shown in Figure 5.

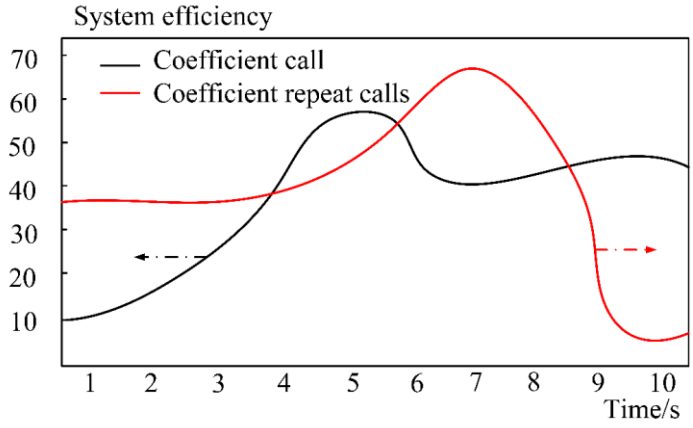

Figure 5: System set to detect efficiency by too large a factor.

As can be seen from Figure 5, the optimized simulated tour system is able to accurately identify problematic values when dealing with special oversized system parameters. The trajectory of the curve in the figure shows that the system has been steadily making parameter value selections and has been increasing in efficiency. The efficiency gradually drops to zero after the system has processed all the data and the overall system processes the data very quickly in terms of time. The optimization of some of the performance of the 5G+VR environmental simulation tourism system with CAD technology is thus judged to be successful, but whether it can be applied to real-life applications will require continuous performance testing.

4 ANALYSIS OF RESEARCH RESULTS ON THE DESIGN OF A 5G+VR ENVIRONMENT SIMULATION TOURISM SYSTEM BASED ON CAD TECHNOLOGY

4.1 Analysis of the Results of the Study on the Construction of A 5g+Vr Environment Simulation Tourism System Based on CAD Technology

In this paper, the CAD-based 5G+VR environment simulation tourism system was constructed in order to validate the system's ability to analyze and process the information transmitted and the overall stability of the selected sample models in a more comprehensive way. A sample of 50 models was selected for the system to be analyzed and processed by the simulated tourism system. In order to ensure the credibility and accuracy of the results of this specific application, the thing models were made as close as possible to real-life buildings and the same experiments were repeated several times. The results of the experiments are compared and the most average values are selected to evaluate the performance of the experiments. When the 5G+VR environmental tourism simulation system with CAD technology enters the working state, it is first confronted with 50 sample models of things that need to be analyzed and processed, and then the data is transferred to the data channel. Then when the overall system starts the model analysis to extract information, when processing the information that does not meet the conclusion will automatically enter the spiral analysis mode, repeatedly consider whether the information is needed, if not will automatically perform the information deletion operation. The purpose of processing information in this way is to improve the correctness of the experimental parameters and results, and also to reduce parameter errors and reflect the overall performance of the system. If, in the course of the experiment, the simulated tour system we have designed can find all the incorrect data, then the final obtained experimental results can be used as a practical reference. Throughout the experiment, we focus on the performance of the 5G+VR environment

simulation tourism system constructed under CAD technology to analyze and study the system performance to determine the results of the practical application. The results of the efficiency data obtained from the final experiment on the computer side are shown in Figure 6.

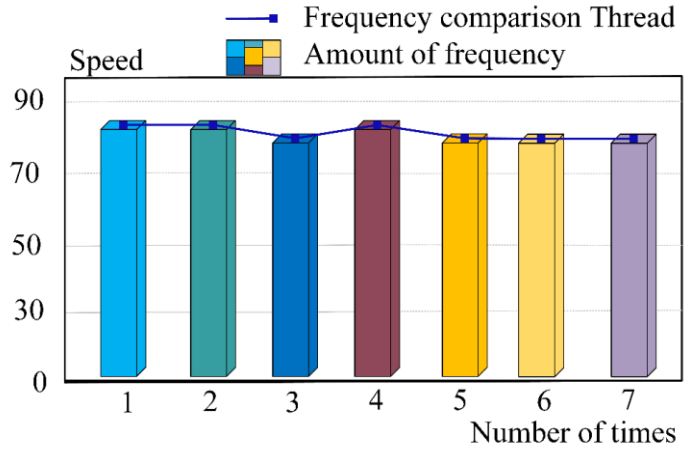

Figure 6: Plot of model sample iterative processing efficiency data.

As can be seen from Figure 6, the performance efficiency of the overall system is between seventy and eighty percent when processing 50 sample thing models for the 5G+VR environment simulation tourism system constructed under CAD technology in working condition. In the face of processing and analyzing 50 groups of complicated thing models for analysis information, the system can still be stable and has achieved the purpose of this experimental results exploration. In summary, the construction of a 5G+VR environment simulation tourism system with CAD technology studied in this paper has a certain practical application basis.

4.2 Analysis of the Results of a Study on the Optimization of A 5g+Vr Environment Simulation Tourism System Based on CAD Technology

This paper is based on a constructed 5G+VR environment simulation tourism system, which is optimized and upgraded. In order to further investigate whether the optimized system can handle the information data better, we will first identify the most important parts of the information data to be studied, then monitor the information processing modules within the optimized system in a targeted manner, and finally use the specific information monitored to analyze the results of the overall simulated tourism system. The process described above allows the results of this experiment to be investigated in the quickest way possible to verify whether the performance of the system has been improved after optimization, although it will take some time to monitor the work between the modules within the system. Once the specific parameter data from the monitored information processing module is available, the subsequent supporting analysis will be straightforward. In order to ensure the accuracy of the experimental results, we continue to perform multiple non-repetitive operations, the reason for this being the differentiation of the information to be taken into account. It is only necessary to analyze whether the different data have been processed correctly and whether there are any errors, and finally it is only necessary to integrate the information obtained. During this experiment, in order to effectively avoid affecting the experimental results due to system failures, the temperature of the overall simulated tourism system was controlled by human beings to avoid short circuits caused by long running times. The final result information, as shown in Figure 7.

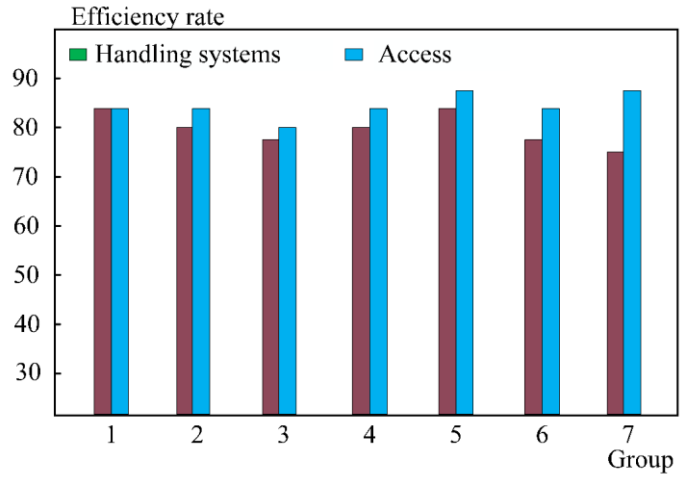

Figure 7: Optimized efficiency of some modules of the simulated tourism system.

As can be seen in Figure 7, the constructed 5G+VR environment simulation tourism system is optimized to ultimately reflect the system's excellent processing of data information when carrying out the analysis of the most important data. It is clear from the processing efficiency within this module that it has improved a lot. In this way, it seems that the 5G+VR environment simulation tourism system with CAD technology that we have designed and optimized can be well applied to the tourism industry, providing convenience and having value for human life.

5 CONCLUSION

The information age did not come out of nowhere, and CAD technology has been slowly gaining traction in the industrial, educational, artificial intelligence and economic sectors. This paper is about the design and construction of a CAD-based 5G+VR environmental simulation tourism system and the optimization of its internal performance. Only by relying on CAD technology to design the overall tourism simulation system can we ensure that we can extract, analyze and filter data from the model in a speedy and efficient manner. By optimizing the CAD technology for the 5G+VR environment simulation tourism system, theoretical methods of wave-injection interaction and non-linear methods of anti-oscillation are added, and information flow channels are added to the already designed tourism system. The purpose of the theoretical algorithms is to allow the 5G+VR environment with CAD technology to accurately and correctly analyze the details of the 5G+VR environment in the face of more detailed models, and to work for longer periods of time, creating more value with less time. The final results of the 5G+VR environmental simulation tourism system with CAD technology and the optimization research problem studied in this paper show that the overall system designed with CAD technology, optimized and unoptimized, performs well for processing information, but does not achieve full processing accuracy. If the system is run for too long and the temperature rises, there are still hidden problems, which we need to solve in the future and need to persevere in finding solutions.

Lu Liu, https://orcid.org/0000-0001-9348-6254
Jinxia Wang, https://orcid.org/0000-0003-1222-6990
Ping Zou, https://orcid.org/0000-0003-1222-6990

REFERENCES

[1] Bertocchi, D.; Camatti, N.; Giove, S.; Van, D.-B.-J.: Venice and overtourism: simulating sustainable development scenarios through a tourism carrying capacity model, Sustainability, 12(2), 2020, 512. https://doi.org/10.3390/su12020512

[2] Cherepashkov, A.-A.; Voronin, V.-N.; Sharaukhova, A.-G.: Training of Cad Target Personnel in the Environment of a Training Virtual Enterprise, Izvestiya of Samara Scientific Center of the Russian Academy of Sciences, 23(3), 2021, 69-72. https://doi.org/10.37313/1990-5378-2021-23-3-69-72

[3] Deng, Y.; Han, S.-Y.; Li, J.; Rong, J.; Fan, W.; Sun, T.: The design of tourism product CAD three-dimensional modeling system using VR technology, Plos one, 15(12), 2020, e0244205. https://doi.org/10.1371/journal.pone.0244205

[4] Kobrin, K.-V.; Manuilov, M.-B.: Fast full-wave technique for CAD of polarizers based on double-ridge waveguide sections, Journal of Electromagnetic Waves and Applications, 34(1), 2020, 70-85. https://doi.org/10.1080/09205071.2019.1688692

[5] Lu, Y.; Bi, C.; Ye, N.; Bo, H.: Auto-establishing simulation parallel manipulators with linear legs and auto-solving their workspaces by utilizing CAD variation geometry, International Journal of Computers and Applications, 39(4), 2017, 220-233. https://doi.org/10.1080/1206212X.2017.1309221

[6] McGrath, G.-M.; Lockstone, B.-L.; Ong, F.; Wilson, E.-E.; Blaer, M.; Whitelaw, P.: Teaching sustainability in tourism education: a teaching simulation, Journal of Sustainable Tourism, 29(5), 2020, 795-812. https://doi.org/10.1080/09669582.2020.1791892

[7] Mikeska, J.-N.; Howell, H.; Straub, C.: Using performance tasks within simulated environments to assess teachers' ability to engage in coordinated, accumulated, and dynamic (CAD) competencies, International Journal of Testing, 19(2), 2019, 128-147. https://doi.org/10.1080/15305058.2018.1551223

[8] Shi, H.; Li, X.; Yang, Z.; Li, T.; Ren, Y.; Liu, T.; Liang, X.: Tourism land use simulation for regional tourism planning using POIs and cellular automata, Transactions in GIS, 24(4), 2020, 1119-1138. https://doi.org/10.1111/tgis.12626

[9] Shpak, N.; Muzychenko, K.-O.; Gvozd, M.; Sroka, W.: Simulation of the influence of external factors on the level of use of the regional tourism potential: A practical aspect, Administrative Sciences, 11(3), 2021, 85. https://doi.org/10.3390/admsci11030085

[10] Xie, C.; Schimpf, C.; Chao, J.; Nourian, S.; Massicotte, J.: Learning and teaching engineering design through modeling and simulation on a CAD platform, Computer Applications in Engineering Education, 26(4), 2018, 824-840. https://doi.org/10.1002/cae.21920