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Research Article

Ecosystem of Digital Media Art under Scientific Computing Visualization Based on Finite Element Analysis

Yuhui Li and Wenjing Zhuge

School of Design, NingboTech University, Ningbo 315100, China

Correspondence should be addressed to Wenjing Zhuge; zgwj@nbt.edu.cn

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Digital media refers to the form of media that appears based on computer information processing technology and has an impact on society. Scientific computing visualization is the study of how to convert digital information generated in scientific computing into intuitive, image, and graphic information. It also studies how to visualize the physical phenomena or physical quantities that change with time and space in front of researchers to gain understanding and insight into the data. This paper aims to study an ecosystem of digital media art. For this system, a scientific computing visualization algorithm based on finite element analysis is proposed in this paper. It uses the algorithm to test the designed digital media ecosystem. The test results are evaluated from three aspects: image quality, system energy consumption, and processing speed. The test results show that the signal-to-noise ratio of the image displayed by the system designed in this paper is always above 50 db, and the maximum can reach more than 60 db. Its power consumption increases by less than 0.02 W for every additional 1 MB of data on average, and the average processing speed is about 3 times per second. This shows that the system has good image quality, low energy consumption, and up to standard processing capacity.

1. Introduction

With the rapid development of the information age, the widespread dissemination of information technology knowledge, the emergence of the "Internet +" micro era, and the diversified development of the art field have also been promoted. Digital media art design also faces enormous challenges. In the 21st century today, the connotation of design is mainly the form of serving the public. Its design goal is still to serve the public as well as businesses. However, the interaction between enterprises and the public has produced revolutionary changes. The design of digital media art is not based on the design of material products but emphasizes the establishment of a complete design ecology.

Information visualization is a very effective method for analyzing and processing information. As the rate of information transmission increases, so does the amount of information people are exposed to and have to process. The need to more effectively process and transform information for dissemination in a visual way is also growing exponentially. What followed was a bottleneck in communication. The current amount of information and growth rate can no longer be solved graphically. It needs a comprehensive form of media to deal with, and digital media, by virtue of its own powerful form of expression, is just in line with it.

Finite element analysis is to replace complex problems with simpler problems and then solve them. Because most practical problems are difficult to obtain accurate solutions, finite element not only has high calculation accuracy but also can adapt to various complex shapes, so it has become an effective engineering analysis method. The finite element method has rapidly expanded from structural engineering strength analysis and calculation to almost all fields of science and technology. It has become a colorful, widely used, and practical and efficient numerical analysis method.

Under the open data resources, digital media design connected to the Internet should be equipped with an integrated design and an interdisciplinary comprehensive design system. Moreover, the growth of digital media in the future requires the development and market application of a

reasonable ecological design system. Looking at it, digital media design should establish a complete design ecosystem. A healthy ecosystem will have far-reaching and scientific significance for the construction of digital media art.

2. Related Work

The arrival of the digital age has endowed artistic creation with new forms and new connotations. More and more digital media technology has entered the stage of artistic creation and exhibition. At present, holographic projection technology has become a popular application technology in the field of digital media art. Safayet et al. discuss the technical principle of holographic projection technology and its application in the field of digital media art. They advise on the application and promotion of holographic projection technology and the development and innovation of digital media art. Safayet et al.'s research shows that holographic projection technology can achieve a 93.34% simulation effect, recording and reproducing 3D images of artworks [1]. Sayre and Lauren explore hip-hop using digital media. Sayre and Lauren found rap music videos and other types of music videos in the research. Although the two share similar production and marketing techniques, using cultural historical activity theory (CHAT) analysis and hip-hop's uniqueness to other forms of visual media is demonstrated in the process. While conducting the analysis, Sayre and Lauren found that a hip-hop music video has more thoughts and ideas than filming it. And it involved a certain context and community, and replying to comments on these music videos is as important to the success of hip-hop as it is to the production [2]. Chowdhury et al. featured low latency, high bandwidth, and high performance with EC. Edge servers can compute undetectable embedding positions that human perception systems are not sensitive to. Chowdhury et al. proposed to quickly embed secret information into digital images at the terminal to realize encrypted communication during transmission [3]. Zhu analyzed the changes that modern innovative education will face. In this case, digital media art and design education is facing a stage of adjustment. Based on the current situation of digital media art design education, Zhu analyzed the influence of digital media art in contemporary art and the existing problems in art design education. It includes the confusion of teaching mode, the existence of deficiencies, and the aging of knowledge construction system and curriculum content. Finally, on this basis, Zhu put forward some countermeasures and suggestions for innovative thinking education [4]. Driven by open innovation, Sugita et al. explored the counter-hegemony of contemporary opera over modern entertainment art. The research method he used is qualitative and uses triangulation. Basic qualitative data was obtained by examining two stories in the play. Data was collected through observation, document review, and interviews with artists and art observers of Bali's theatrical gong culture. Sugita et al. used semiotic theory and semiotic interaction theory for qualitative descriptive analysis. His results showed that since the 1980s, in order to maintain its existence, the performing arts of opera have been reinvigorated as a form of counter-hegemony to counter the modern art of entertainment today [5]. The digital media arts major is an applied discipline. Practical teaching occupies an important position in the whole teaching system. Ongus and Nyamboga learned from data analysis in recent years that new design concepts, new expressions, and new technologies are constantly emerging, and the requirements for design talents are getting higher and higher. In the construction of the practical teaching system, Ongus and Nyamboga proposed to focus on the reform and construction of professional courses. They formulated curriculum construction planning ideas, revised teaching plans, updated practical teaching content, and formed a plan to improve teaching quality [6]. Although the above case studies on digital media have achieved some results. But most of these studies have explored at the theoretical level, and there are relatively few innovative perspectives on the digital media ecosystem. It hardly involves the design and development of the system, so further in-depth exploration is needed.

In this paper, the ecosystem of digital media art based on scientific calculation and visualization in finite element analysis shows good image effect, low energy consumption, fast system processing speed, high overall reliability, and strong stability.

3. Digital Media Art Ecosystem Based on Finite Element Analysis

3.1. Digital Media

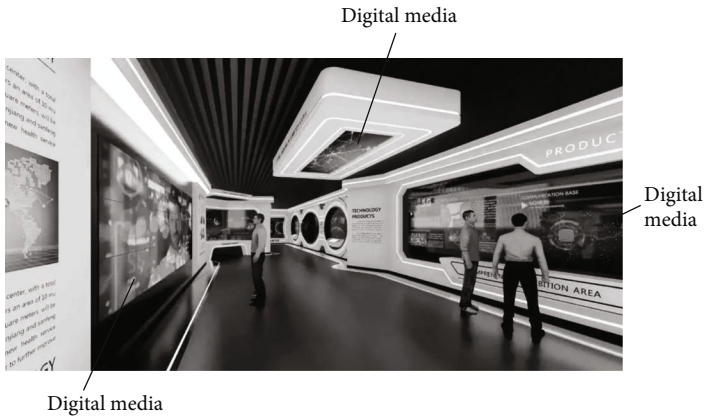
3.1.1. Concept. The development of digital media is changing with each passing day in Table 1. Digital media art is a discipline based on technology, art, and the collision of emerging disciplines of technology and art. It is the union of the artistic and technological capabilities of the regions. The digital media commonly used today refers to the media forms that appear based on computer information processing technology and have an impact on society. Figure 1 shows a real-world application of digital media [7].

3.1.2. Origin and Development. The conceptual origins of digital media can be traced back to the publication of researchers in 1945. It envisions a system of devices to help professionals store, analyze, and communicate information. The true definition of digital media was first proposed at the annual meeting of the United Nations Information Committee in May 1998 [8, 9].

3.1.3. Features. The main feature is that digital media is in the form of binary numbers. Digital media breaks traditional chapter catalogs with hyperlinks. People used to read and acquire knowledge through the directory frame, and the emergence of hyperlinks can present the content to the audience in a more flexible and convenient way. Changes in digital communication channels will make information no longer a one-sided communication, but a mode with interaction. Digital media has broken the regular and quantitative dissemination mode of traditional media. When the audience needs to obtain relevant information, they only need

Table 1: Research ideas about digital media.

Sequence	Stage	Content
1	Concept	Digital media art is a discipline based on technology, art, and the collision of emerging disciplines of technology and art.
2	Origin and development	The true definition of digital media was first proposed at the annual meeting of the united nation information committee in May 1998.
3	Features	The main feature is that digital media is in the form of binary numbers. Digital media breaks traditional chapter catalogs with hyperlinks.
4	Classification	Interactive media, virtual reality, augmented reality, mixed reality, immersive media, stereoscopic projection, big data media, and artificial intelligence.
5	Status quo	Digital media is currently thriving through its impact on society and individuals. The field of its development will continue to expand with the advancement of science and technology.
6	Visualization of digital media application scenarios	News reports, video dissemination, exhibition halls, museums news reports, public space exhibitions, and immersive experience



(a) Digital media exhibition

(b) Digital media stage

Figure 1: Applications of digital media.

to give operation instructions, and they can check the latest information in real time [10, 11]. The area of digital media and traditional media can be shown in Figure 2. The propagation state changes: The biggest difference between digital media and traditional media is the change in the state of communication. It changes from point-to-multipoint to multipoint-to-multipoint. From the perspective of communication science, everyone can carry out mass communication, and the information communicated has nothing to do with the importance of meaning. This has greatly enhanced the initiative of the audience, and mass communication in the traditional sense has become increasingly niche and individualized. Depending on the way of communication, digital media has the advantages of both interpersonal and mass media. Personalized messages can reach countless groups of people, known or not, at the same time. Each participant, whether publisher, communicator, or consumer, has peer-to-peer and mutual control over the content. Digital media

(a) Traditional media (b) Digital media

Figure 2: Differences between digital and traditional media.

again dispenses with the shortcomings of interpersonal and mass media. When the communicator wants to communicate to the public at the same time, it can also provide personalized content for each recipient. Diversity of communication purposes: It also constitutes a trend towards diversification of the dissemination purpose of digital media. Communication purposes have become diverse, complex, and ambiguous. Infinite range of spread: Another distinctive feature of digital media compared to traditional media is that it dissolves the boundaries between traditional media (television, radio, newspapers, and communications). It also dissolves borders between countries, between communities, between industries, and between senders and receivers of information. Boundless propagation range becomes uncontrollable and unknowable demand, and transmission and production based on network and digital technologies are becoming increasingly limitless. Simplicity and low cost of dissemination techniques: The information release of digital media is close to zero cost, and the audience is free, and the communication technology and cost are much simpler and cheaper than traditional media.

3.1.4. Classification. Digital media is a discipline that is still expanding outward. Through the analysis of the case, the author can classify digital media according to the purpose of dissemination: dissemination digital media, interactive digital media, and intelligent digital media. It can be divided into interactive media, virtual reality, augmented reality, mixed reality, immersive media, stereoscopic projection, big data media, and artificial intelligence [12], as shown in Table 2.

3.1.5. Status Quo. Today's digital media can obtain knowledge and access news at any time without leaving home only through the network and mobile communication devices. These also benefit from the continuous development of digital technology. Using the theoretical essentials of digital media to study problems is a breakthrough in the practical field of digital media art. This will facilitate the growth of the digital media art system. It studies the design subject and the interaction between design behavior and digital products and social environmental conditions. This forms a win-win connection between the existence and expression of digital art forms. Digital media is currently thriving through its impact on society and individuals. The field of its development will continue to expand with the advancement of science and technology and will have a greater impact on future production and life [13].

Table 2: Classification of digital media.

According to the form of expression	According to the purpose of communication
Interactive media, immersive media	Communication-type digital media
VR, AR, mixed reality	Interactive digital media
Stereographic projection	Smart digital media
Big data media, AI	

3.1.6. Visualization of Digital Media Application Scenarios. The application scenarios of visual digital media can be shown in Table 3.

3.2. Digital Media Art Ecosystem

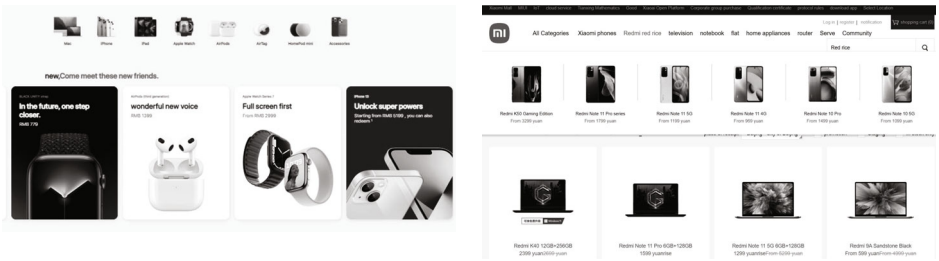
3.2.1. Ecosystem Concept. A theoretical ecosystem is a system within a structure that can complete its own transformation. It is inseparable from the interaction between organisms and ecological environment factors in a certain period of time and is inseparable from the balance and stability of the various components of the ecosystem. The use of ecological words on the Internet can be said to be a relatively metaphorical statement or bionic parameter. That is, the design of the key value chain to create an ecological enterprise is to support the ecosystem, not just to find a reasonable structure of the ecosystem. But it is important to determine which link in the value chain is to be controlled by the people who build it, so as to design a business model with regular production [14].

3.2.2. Elements of the Ecosystem. The components of an ecosystem are as follows: nonliving species and energy consumption, productivity, consumers, and decomposers. The designed model can apply the theory of ecosystem. Simple ecosystems can grow rapidly but are hard to recover from if they take a hit. Well-thought-out ecosystems can have high development potential. If the existing Internet world is viewed as an ecosystem, then design is assumed to be a parasitic ecosystem: design is parasitic on the existing Internet system. However, since the design is in a relatively closed environment, as long as the closed environment is large enough, the design can grow sufficiently robust [15, 16].

3.2.3. Cases of Digital Media Ecosystems. Apple has the best product design. Since 2004, Apple has received more than 70 Red Dot Product Design Awards. However, Apple's real success comes from its well-planned ecodesign. MI is also

Table 3: Application scenarios of visual digital media.

Information dissemination needs	Purpose effect	Application scenarios
Clearly explain information	Information sorting and classification	News reports, video dissemination
Accurate retrieval of massive information	Retrieve on demand, location information	Exhibition halls, museums
Big data visualization	The public can read and understand the data	News reports, public space exhibitions
Enhance information perception	Make up for sensory defects, visual shock	Immersive experience



(a) Apple ecosystem (b) Xiaomi ecosystem

Figure 3: Examples of digital media ecosystems.

a success story of successful ecodesign. Hardware research + software development + Internet environment constitute the main production form of Xiaomi's design ecology. Xiaomi looks at industrial design from the perspective of enterprise design ecology. On the Xiaomi industrial designer business card, the industrial design department is a part of the Xiaomi ecosystem (MI ecosystem). Figure 3 shows the official websites of the two ecosystems [17, 18].

3.2.4. The Research Value of Ecosystem. Systematic ecological design can provide designers with a better and wider display space. The intelligent and systematic operation method is the artistic companion of an excellent designer. Human-computer interaction is the key to the future of the system transformation art of the future. The designed works are closely related to the careful logical thinking of the designer. It is created through the instigation of the concept of art and through technology to create a complete art. This just shows that digital media art needs ecological guidance methods in order to express valuable works and bring more novel artistic experience [19].

3.3. Finite Element Analysis

3.3.1. Concept. Finite element analysis is the use of mathematical approximations to simulate real physical systems (geometry and loads). Simple but interacting elements (i.e., cells) can be used to approximate real systems with an infinite number of unknowns using a finite number of unknowns [20].

3.3.2. Origin and Development. Finite element analysis began as a solid modeling technique in the late 1990s based on Boolean operations on simple voxels. Solid modeling combined with finite element meshing and postprocessing is a technique developed in the mid-1980s. Finite element analysis is gradually emerging on the basis of the development of graphics and computer hardware technology. Its development can be divided into the initial stage, the exploration stage, and the mature stage, as shown in Figure 4 [21].

3.3.3. Features. The finite element method can not only calculate and analyze various complex shapes of geometry but also process complex materials corresponding to various properties. It can be applied to homogeneous or nonhomogeneous continuous materials. The finite element method can be applied to different boundary conditions. The finite element method can quickly find design defects in product development and design. It also provides a theoretical basis in the subsequent optimization and improvement process to improve the reliability of the product [22].

The finite element method defines the function on the element domain (slice function) of simple geometric shapes (such as triangles or arbitrary quadrilaterals in two-dimensional problems) and does not consider the complex boundary conditions of the entire definition domain, which is superior to the finite element method, one of the reasons for other approximation methods.

3.3.4. Finite Element Analysis Software. It consists of a generic implicit solver and an explicit solver analysis module. A complete solver analysis process is shown in Figure 5.

3.4. Visualization of Scientific Computing. Scientific computing visualization is the study of how to convert digital information generated in scientific computing into intuitive, image, and graphic information. It also studies how to visualize physical phenomena or physical quantities that change over time and space to researchers in order to gain understanding and insight into the data. The main feature of scientific computing is that it has high numerical calculation requirements and generates massive digital information in the calculation process. The main task of researchers is to gain insight into the laws and characteristics hidden in the data, so as to gain knowledge and understanding of the research object. As a new discipline, visualization has been

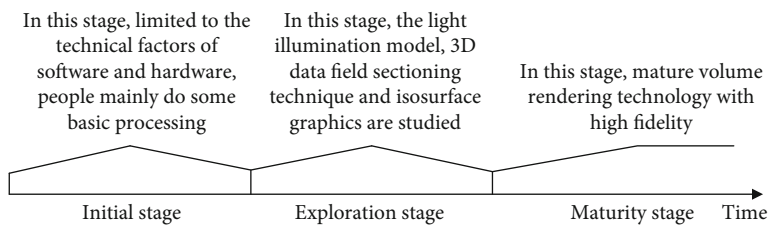


Figure 4: The evolution of finite element analysis.

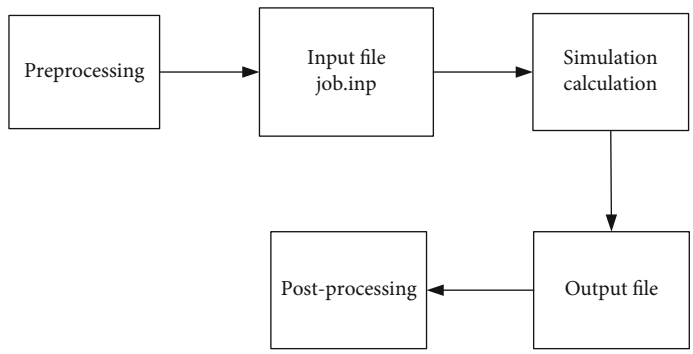


Figure 5: Analysis process of finite element software module.

Table 4: Typical techniques for visualization in scientific computing.

Dimensions	Scalar	Vector	Tensor	Multidimensional variables
1D	True line drawing, column chart, and bar chart	———	———	Combining scalar, vector, and tensor methods
2D	Outline, surface view, and image display	2D arrow	———	
3D	Isosurfaces, volume rendering, and 3D point cloud surfaces	3D arrows, particle systems, and 3D streamlines	Tensor ellipse	
nD		Use multiple IDs, 2D or 3D views		

widely used in many science and engineering fields such as earth science, space exploration, meteorology, oceanography, biology, medicine, mathematics, computational fluid dynamics, and finite element analysis. This becomes a powerful tool for analyzing and understanding various natural phenomena in scientific research [23].

Typical techniques for scientific computing visualization can be shown in Table 4.

Scientific computing data visualization firstly vectorizes the data, and its formula is as follows:

$$\text{xend} = \text{xstar} + \frac{v_x}{|V|} t, \tag{1}$$

$$\text{yend} = \text{ystar} + \frac{v_y}{|V|} t, \tag{2}$$

where (xstar,ystar) represents the starting point coordinate and (xend,yend) represents the end coordinate point. $|V|$ is the vector modulo value and t is the time step. The v_x represents the vector component in the horizontal direction and the v_y represents the component in the vertical direction.

The RGB components of vector coordinates are

$$I_{\text{RGB}} = \frac{|V| - |V_{\min}|}{|V_{\max}| - |V_{\min}|}. \tag{3}$$

For spatial coordinates (x, y, and z), its streamline formula is

$$\frac{dx}{u} = \frac{dy}{v} = \frac{dz}{w}, \tag{4}$$

where u, v, and w represent the corresponding velocity components, respectively.

Assuming that there is a point P in the vector field V, and its vector is $\bar{r}$, then the tangential vector of the streamline at point P is

$$\frac{d\bar{r}}{dt} = \bar{v}(\bar{r}(t)). \tag{5}$$

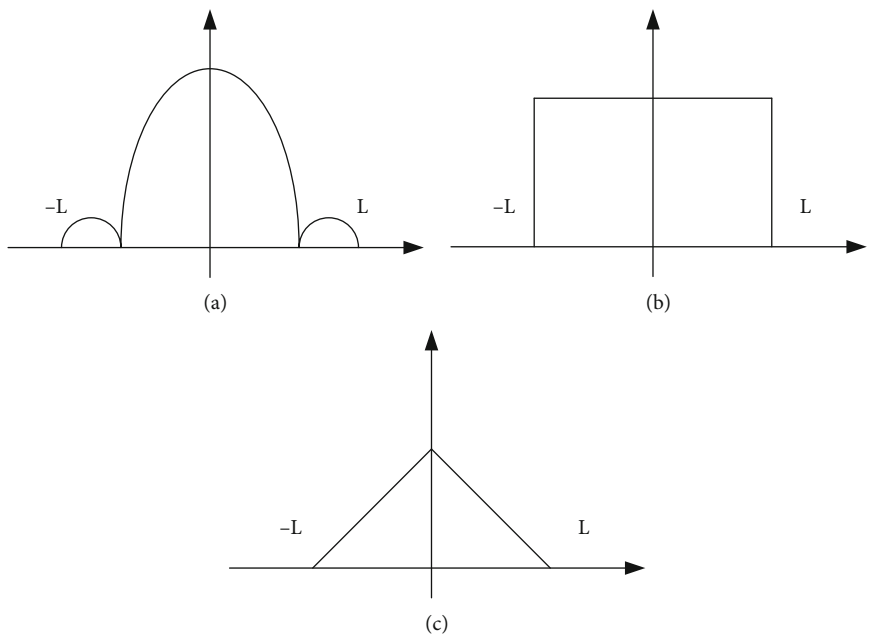


Figure 6: Several commonly used convolution kernels.

It can be obtained from this integral that

$$\bar{r}(t) = \bar{r}(0) + \int_0^t \bar{v}(\bar{r}(t)). \tag{6}$$

For point $(x\,y\,z\,1)$ in 3D, coordinate projection is performed through the change of the model matrix, and the coordinate transformation formula is

$$[\mathrm{x\,y\,z\_buffer}]^{\mathrm{T}} = V \cdot P \cdot \mathrm{M}[\mathrm{X\,Y\,Z\,1}]^{\mathrm{T}}. \tag{7}$$

Instead, the spatial coordinates of the corresponding points can be calculated from the projected coordinates, and the formula is

$$[\mathrm{X\,Y\,Z\,1}]^{\mathrm{T}} = \frac{[\mathrm{x\,y\,z\_buffer}]^{\mathrm{T}}}{V \cdot P \cdot M}. \tag{8}$$

The initial step size is determined as

$$t_0 = \frac{\sqrt[3]{V}}{|u|}. \tag{9}$$

For tracer particles, the formula of motion is

$$\frac{dr}{dt} = v, \tag{10}$$

$$m\frac{dv}{dt} = f, \tag{11}$$

where m is the particle mass, v is the velocity, and f is the force.

For a 2D vector field, its formula calculated by convolution is

$$I(x_0) = \frac{1}{\int_{-L}^{L} K(s)\mathrm{d}s} \int_{-L}^{L} k(s - s_0) T(\sigma(s))\mathrm{d}s. \tag{12}$$

It uses h to represent the weight of the grayscale in the output graphic, then

$$h_i = \int_{S_i}^{S_i + \Delta S} k(\omega)\mathrm{d}\omega. \tag{13}$$

In the formula, S_i represents the length of the streamline after the ith step, and ΔS is the length of the streamline at the ith step.

$$s_i = s_{i-1} + \Delta s_{i-1}. \tag{14}$$

Figure 6 shows several commonly used convolution kernels. The expression in Figure 6(a) is

$$k(\omega) = \frac{1 + \cos\,(c_\omega)}{2} + \frac{1 + \cos\,(d_\omega + \beta)}{2}. \tag{15}$$

For an image $f(x, y)$, its gradient operator during image processing is

$$G[f(x, y)] = f\sqrt{\left(\frac{\partial f}{\partial x}\right)^2 + \left(\frac{\partial f}{\partial y}\right)^2}. \tag{16}$$

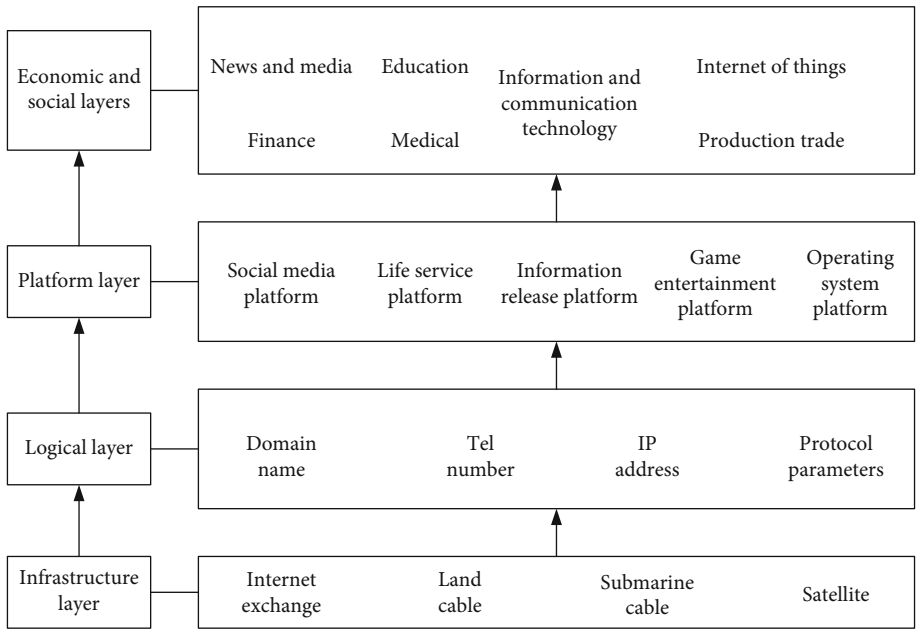


Figure 7: Visualizing the digital media ecosystem architecture.

Table 5: System test environment.

Network environment	100 M broadband
Testing system	Win 10, 64 bit OS, Intel Core i7
Image processing software	OpenGL
Data processing tool	Storm
Test power	50 W
Test duration	1 hrs
Test media data volume	800 M

Its gradient direction is

$$\theta(x, y) = \arctan \frac{\partial f / \partial y}{\partial f / \partial x}. \tag{17}$$

Derivatives in digital images are approximated by first-order differences. It can replace the first-order differential with the first-order difference. Its formula is

$$\frac{\partial f}{\partial x} = f(i, j+1) - f(i, j), \tag{18}$$

$$\frac{\partial f}{\partial y} = f(i, j) - f(i+1, j). \tag{19}$$

Finding the gradient is for the sum of squares operation and the square root operation, which can be represented by the sum of the absolute values of the two components, namely,

$$G(i, j) \approx \sqrt{\left(\frac{\partial f}{\partial x}\right)^2 + \left(\frac{\partial f}{\partial y}\right)^2} \approx \left|\frac{\partial f}{\partial x}\right| + \left|\frac{\partial f}{\partial y}\right|. \tag{20}$$

4. Digital Media Arts Ecosystem Test

4.1. System Design. The design process suggests establishing the following ecological principles: principles of consistency in digital media imagery: it communicates to users through active digital media artistic design image, making digital communication convenient and time-sensitive. Principles of identified system consistency: the digital media ecodesign should incorporate the basic visual elements of the brand. It is consistent with the design of Internet-based digital media applications, and the design is beautiful. Principles of pertinence brand design: accurate brand positioning can bring great benefits to brand communication, that is, market environment and user needs. Different online media need to be selected for effective brand promotion to specific user groups. This ultimately builds a good digital brand image in the minds of product users.

This digital media ecosystem is divided into infrastructure layer, logical layer, platform layer, and economic and social layer, as shown in Figure 7. The infrastructure layer is the arrangement of the infrastructure, and the logic layer is the collection, processing, analysis, and transmission of various data. The platform layer is the media sharing, display, and management of data, and the economic and social layers are the dissemination of data media, the cooperation of enterprises, and the application of technology [24].

4.2. System Test. The purpose of the test is to understand the stability and actual reliability, security, and so on of the system. The system test environment is shown in Table 5.

During the test, the video image quality, energy consumption, and processing speed are mainly recorded. The video image quality (the signal-to-noise ratio of the image is the same as the sharpness of the image, they are all important indicators to measure the image quality, and the signal-

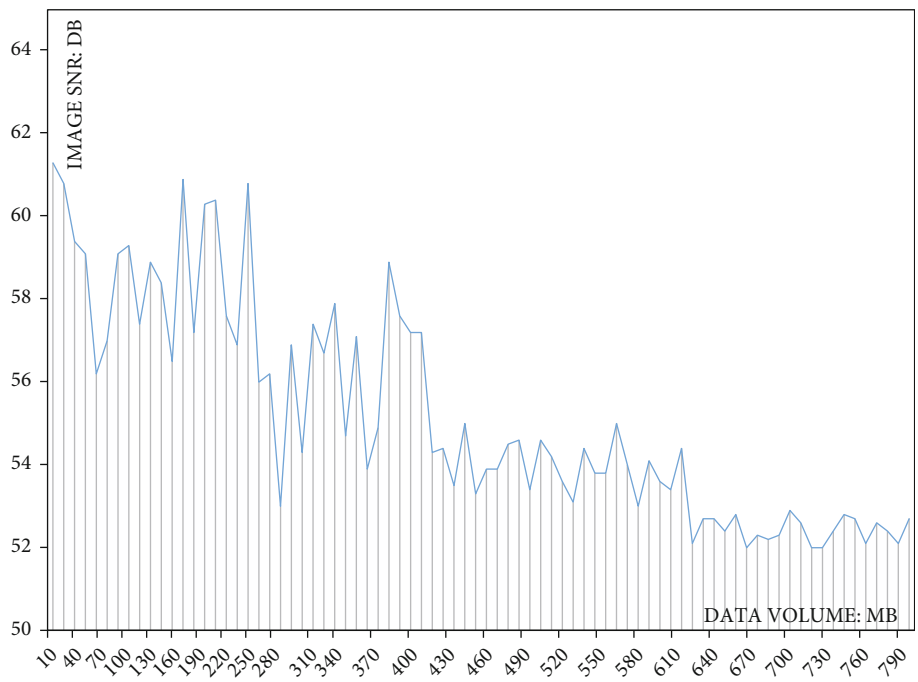


Figure 8: Image SNR.

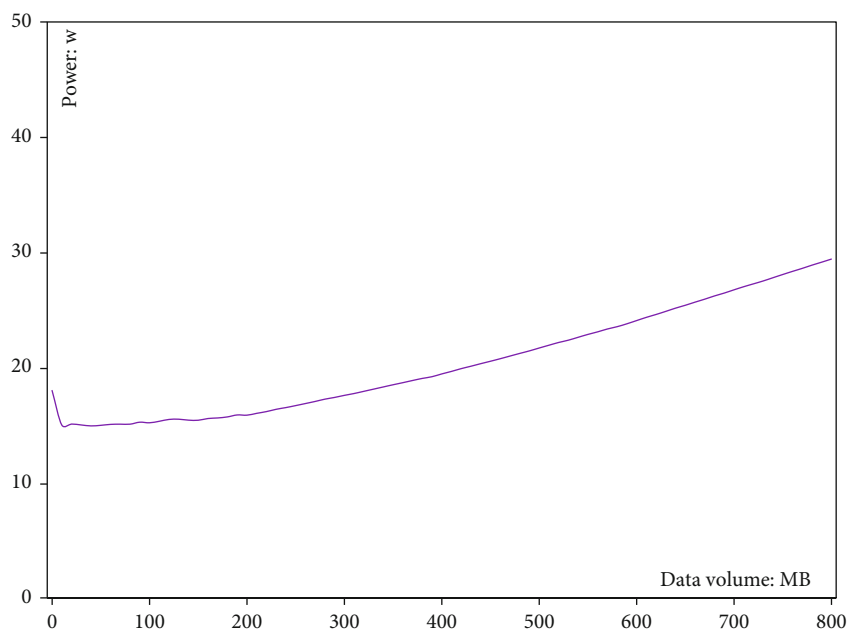


Figure 9: System energy consumption.

to-noise ratio of an image refers to the ratio of the size of the video signal to the size of the noise signal) is represented by the image signal-to-noise ratio, and the results are shown in Figure 8.

It can be seen from Figure 8 that the signal-to-noise ratio of the image is always above 50 db during the testing process of the system. Its maximum can reach more than 60 db, indicating that the image quality of the system is good.

The system energy consumption is shown in Figure 9. It can be seen from the data in the figure that the energy consumption of the system increases with the increase of the amount of data. But the speed of its increase is not very fast, from the initial 10 M to 800 M. Its power is increased from 15 W to 30 W, and its average increase is less than 0.02 W per MB. Therefore, the energy consumption of the system is relatively low, and from the curve point of view, the operation of the system is relatively stable.

The calculation speed of the system is shown in Figure 10. It can be seen from Figure 10 that the processing times of the system in one hour are 10710 times, the average

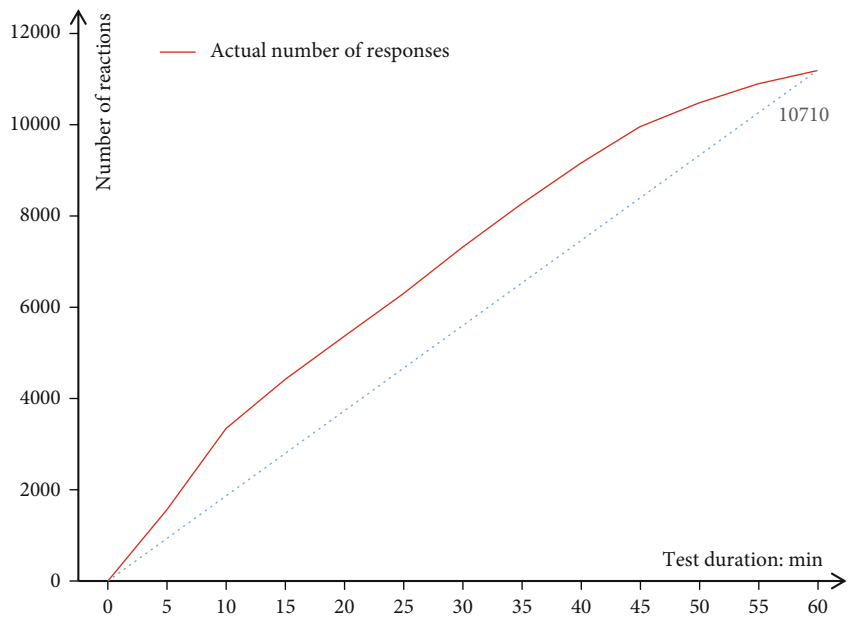


Figure 10: System processing speed.

processing speed is about 3 times per second, according to Figure 8, the minimum primary image size is 10 MB, that is, the average processing speed is at least 1 second, 30 MB, and therefore, the image processing speed is good.

5. Discussion

Information visualization has been used for a long time. Using pictures to tell a story and illustrate a problem has proven to be an effective way of conveying information. According to research, 80% of people can remember what they see, but only 20% remember the information they read through text. At this stage, it has become a trend to further improve the effect of information visualization through digital media.

The development of digital media has brought a new design method and design concept to the information visualization design. Because in the form of digital media, information visualization can use more means of expression. It also brings more creative ideas to the designer's inspiration and thinking. But it is worth noting that some forms of information visualization have already achieved accurate communication, and the form is concise and clear. It is an optimal state in itself, and there is no need for digital media to combine at this time. A good visualization is not something that can be achieved simply by using novel representations. This also requires the designer's own aesthetic requirements and judgment on the information content. The new design language brought by digital media can reach a whole new level of effect. But a good information visualization design should still focus on the information itself and the purpose to be conveyed.

Finite element analysis is a typical representative of three-dimensional irregular data fields. Finite element post-processing has its particularity, and it is difficult to directly apply the commonly used algorithms in graphics, and it must be dealt with in a flexible manner. For example, when the data field is blanked as a whole, all faces of all cells are directly processed, and the execution efficiency will be unbearable. It must first extract the outer surface of the data field, that is, the contour surface, and then use the angle between the surface and the line of sight to determine the possible visible surface. According to the characteristics of the finite element itself, any surface of the element is a convex polygon, and the positions between any two surfaces are connected at most, and it is impossible to interlace in space. Therefore, the painter's algorithm in the blanking surface is selected, and the execution efficiency of the program is optimal at this time.

6. Conclusion

This paper firstly summarizes the research purpose and content of this paper in the abstract section. It introduces the background meaning of this article and some key contents in the introduction section. Secondly, it lists some research results of some scholars on the main content of this paper in the related work part, so as to understand the current situation of digital media art.

In the theoretical research part, this paper firstly introduces digital media, including its concept, origin and development, classification, status quo, and application. Secondly, this paper introduces the digital media art ecosystem, including its concepts and ideas, components, related examples, and research values. This paper then introduces the concepts and characteristics of finite element analysis and scientific computing visualization and finally explains the scientific computing visualization algorithm of digital media art in this paper.

This paper firstly introduces the overall architecture of the system design in the experimental test. In this paper, the test is carried out according to the environment set by

the test, and finally, the test results are described with the chart. The final result shows that this paper is based on the ecological system of digital media art under scientific computing visualization in finite element analysis, and the displayed image effect is good. Its energy consumption is low, the system processing speed is fast, the overall reliability is high, and the stability is strong.

Data Availability

The readers can contact the first author (email: zgwj@nbt.edu.cn) for source codes.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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