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# Artistic Virtual Reality Scene Analysis Taking into Account the Interactive Digital Media Pattern Generation Technology

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***Abstract: -*** With the development of science and technology and the continuous strength of Chinese spiritual civilization, digital media patterns have penetrated into various fields and played a central role in them. This article studies the endless emergence of various new media, and the channels of information dissemination are becoming more and more abundant. With the development of science and technology, new media are gradually derived, such as: IPTV, electronic magazines, etc., which have developed on the basis of traditional media. But there is a qualitative difference from traditional media. Digital media has a profound impact on mass society.This article proposes that digital media has become the most important means of communication in the information society. The digital media creative industry and the country's economic development have formed a close relationship of interdependence and mutual promotion. Based on the interactive digital media model generation technology, the research of artistic virtual and real scene analysis is the main issue today. The experimental results of this paper show that through the experimental investigation and analysis in 2019 and 2020, it is found that the application trend of company A and B in the virtual reality situation has increased significantly. The application rate of company A and B in 2019 reached about 43%, but the trend is not unstable. However, in 2020, it can be clearly seen that the application rate of companies A and B in applying digital media patterns to virtual and real scenarios has stabilized, exceeding 35% every month. It can be seen in the text below that when the four models are in different periods, the value of the optimal solution is different, and when the model is at 0.1 and 31, the optimal solution appears.Experiments show that digital media is widely used in the analysis of virtual and real scenarios. Based on the new research field formed by the fusion and intersection of digital media patterns, starting with the changes in the main body, objects, tools and forms of virtual and real scene communication in the context of digital media, it conducts in-depth research on the creation of artistic virtual and real scenes from many aspects.

***Keywords:*** Taking into Account the Interaction, Digital Media Pattern, Digital Media Pattern Generation Technology, Artistic Virtual Reality Scene Analysis.

## 1. Introduction

The rapid rise of digital media has gradually become the mainstream, providing people with high-speed and massive information and communication platforms, changing the ways and methods of people contacting and disseminating information. At present, it has been widely used in various industries, such as space design, visual art, advertising media, etc. which affects people's life, study, work, production and even thinking at an alarming rate. Digital media has become the most important means of communication in the information society. In today's society, computer technology has been deeply rooted in the hearts of the people. Computer is a wonderful tool for creative thinking. It is an extension of our visual function and the function of the cerebral visual cortex. Through this extension, we can see more scenes that we could not see before. As a computer simulation system that can

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create and feel the virtual world, 3D digital virtual reality technology takes the computer as the medium to simulate or real or imaginary scene environment. It is an interactive system simulation of 3D dynamic scene and entity behavior with diversified information fusion.The lives of the general public have undergone tremendous changes, and they have continued to innovate with the development of new media technologies. The application of digital media art in the art scene is the product of the perfect combination of science and technology and modern art. In order to understand the essence of digital media art, we must find the logical starting point and theoretical structure of the close integration of the two in research methods. The lives of the masses have undergone tremendous changes as a result, and will continue to innovate with the development of new media technology. The rapid rise of digital media has gradually become the mainstream, providing people with a high-speed and large-scale information communication platform, and changing the way people contact information dissemination. Digital media is the most important means of communication in an information society. The application of digital media art in the field of art is the product of the perfect combination of science and technology and modern art. To understand the nature of digital media art, there are two research methods.

With the rapid development of information technology, digital video art, digital lighting art, and digital interactive art are becoming more and more popular. In order to meet the general aesthetic needs, design elements and new technologies need to be perfectly combined. Digital media art injects new vitality into virtual and real scenario analysis, which has an important impact on graphics and image research in today's new media industry.

With the rapid development of social economy, the application of digital media pattern generation technology has become more and more extensive. Craciun S believes that image segmentation is essential for image processing because it provides a solution to the task of separating objects in an image from the background and each other, which is an important step in object recognition, tracking, and other advanced image processing applications. By dividing the input image into smaller regions, segmentation performs the balancing act of extracting main regions of interest (objects and important features), image segmentation applications branch to multiple fields, from decision-making applications in computer vision to medical imaging and quality control and so on. The mean shift algorithm provides a unique unsupervised clustering solution for image segmentation, and it has a good performance record on various input images [1]. V Kumar believes that four-dimensional (4D) bioprinting covers a wide range of disciplines, including bioengineering, materials science, chemistry and computer science, and is becoming the next generation of biomanufacturing technology. By using stimulus-responsive materials and advanced three-dimensional (3D) bioprinting strategies, 4D bioprinting aims to create dynamic 3D patterned biological structures that can change their shape or behavior under various stimuli. He emphasized the potential uses of various stimulus-responsive materials in 4D printing and their expansion in biomanufacturing, and discussed the latest technologies and limitations related to current 3D printing methods, as well as their transformation to include additional time dimensions[2]. Gaprindashvili G analyzed that national-level large-scale landslide risk assessment requires methods and data that are different from large-scale standard practices. The main goal of this study is to design a method for the national landslide risk assessment in Georgia, taking into account the limitations of data availability and detail, which do not allow the use of physical-based models or statistical methods. In view of these limitations, they decided to use the spatial multi-criteria assessment (SMCE) to generate a qualitative landslide risk index [3]. Kurtz found that a large number of digital and social media information related to the restoration of historical memory on the Internet show how today's Spaniards continue to deal with events triggered by the dictatorship of Francisco Franco. In a constantly connected world, it is not surprising that a wave of media flooded the Spanish public, focusing on the recovery of victims in the mass graves of the Iberian Peninsula. Digital media and its various communication methods encourage the continuous updating of information, and provide producers of digital materials and users of social networking sites with a means to continuously update the dialogue about rehabilitation work [4]. Hacmun I discovered that the latest advances in technology have enabled the creation of an immersive digital environment commonly referred to as virtual reality (VR). The current research explores the potential of art creation in VR in art therapy (VRAT) from the perspective of an expert art therapist. Seven art therapists participated in this research. As observers, they all tried to create visual art in VR. After the VR experience, semi-structured interviews were conducted to evaluate the core aspects of their experience as creators and observers. The interview is analyzed in accordance with the principle of thematic analysis. The survey results revealed four main themes: the user experience in VR; the quality of VR materials and media; the VR treatment environment; and the relevance of VR media to art therapy. The

results show that the therapist foresaw the great potential of the new VR media in art therapy and emphasized the further research directions needed to determine how virtual media can be used to treat real-world problems [5]. Steubing B found that the environmental performance of a product or service is usually the result of many key decisions (for example, technology choices) that affect its life cycle. This article introduces a modular LCA method that can reduce the work involved in performing scenario analysis and optimization when several key choices in the product value chain lead to many alternative life cycles. The main idea of the method is to divide the value chain of the product into interconnected but exchangeable modules, which together represent a complete life cycle. A module is composed of unit procedures in the practitioner's LCI database. The input, output and system boundaries of each module can be customized according to the context of the system under study. Whenever multiple modules produce replaceable products, substitutes will appear. Unlike traditional LCI databases, no copies are required to represent the same process with different inputs [6]. Sohrabi B studied Iran's first implementation of the flipped classroom model. Young students use flipped classrooms to gain academic results, and managers use class time to discuss their labor issues. Students prefer resources other than lectures, such as TED and documentaries. Watching English videos is both a challenge and an opportunity for students [7]. Fung K M found that examining slides is essential in pathology training. Before the introduction of digitized whole slide images that can be accessed through a computer network, the sharing of pathology slides was a major logistical issue in pathology education and practice. With the help of the entire slide picture, he has developed a number of online pathology education websites. The program is based on a modular architecture and provides online access to entire slide images, still images, case studies, quizzes and teaching texts at different levels. Together with traditional lectures and practical experience, it forms the backbone of our histology and pathology education system for residents and medical students. The use of digital full-slide images has also greatly improved the communication between clinicians and pathologists in the institute [8]. Through the research and analysis of scholars, it can be known that taking into account the interactive digital media pattern generation technology is a crucial factor in the analysis of artistic virtual and real scenes, how to scientifically apply it to the analysis of artistic virtual and real scenes is the most critical.

The innovations of this article are: (1) This article is based on the elaboration of the relevant theories and technical theoretical knowledge of digital media patterns, based on the role of digital media patterns related theories and technologies, and establishes the relevant theories and technologies of digital media patterns to make them in the virtual reality scenario analysis design can play a great role. (2) Experiments were conducted on the interactive algorithm and the distance comparison between the optimal solutions. Finally, it can be seen that the hybrid method is better than the expectation of variance synthesis method and better than the expectation method.

## 2. Variance Expectation Synthesis Method and Interactive Algorithm

The application of digital media technology in various fields and industries is becoming more and more widespread, as is sports teaching. The emergence of digital media technology can collect and organize diversified teaching resources for physical education, enrich teaching methods, and effectively increase the fun, flexibility and interactivity of physical education, therefore, the innovative use of digital media technology in sports teaching has positive practical significance.The expected variance is also known as the expected variance, the variance obtained by infinite number of measurements.

The rapid development of digital media technology has had a great impact on the performance of virtual and real scene art. As the key to artistic communication, graphic elements can reflect the development characteristics of the times [9]. This article mainly studies the graphic elements of digital media. In order to show the characteristics and unique beauty of graphic elements, digital media technology is used to promote the specific expression methods of graphic elements in digital media and the development of graphic culture [10]. As shown in Figure 1:

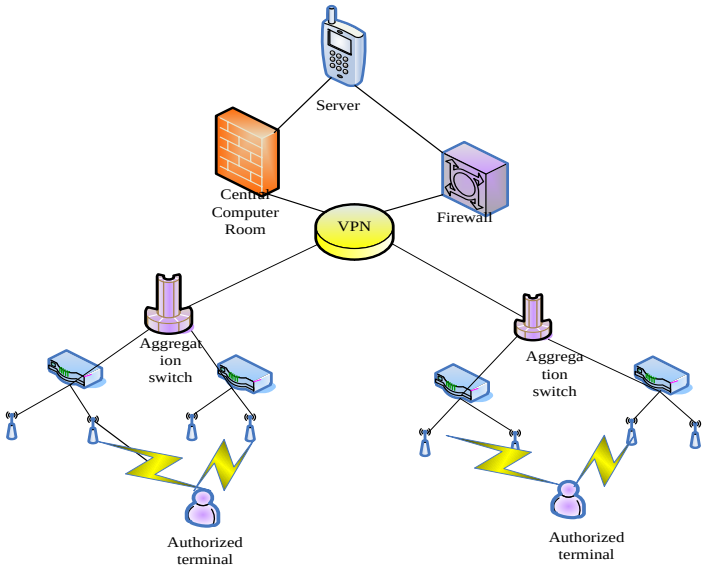


Figure 1. Graphic element diagram in digital media

As shown in Figure 1, "Big Data-Cyberspace", as the dissemination carrier and field of various ideologies and social thoughts, has also encountered opportunities and challenges [11]. On the one hand, the "big data cyberspace" has brought quantifiable and calculable audiences, communication content, communication methods, and communication effects to the expansion of mainstream ideology, achieving precise and personalized communication. On the other hand, "Big Data-Cyberspace" has also brought challenges to mainstream ideological dissemination, including: the decline of communicators' experience and their own concealment under the rational publicity of big data technology, the distortion of audience portraits in digital communication, and fake news, the in-depth turn and the post-truth of the communication ecology, the interference of capital logic and algorithmic logic on the mainstream ideological communication logic.

The development of digital media has also provided more innovative methods and platforms for advertising communication, making the rapid development of interactive advertising possible [12], printed interactive advertising, television interactive advertising, and gradually formed Internet interactive advertising, digital mobile interactive advertising and other type. Formed the existing coexistence and complementary mode of multiple types of interactive advertising, and its advertising performance and publishing methods often adopt new technologies. Among them, the development of online interactive advertising is the fastest, and the advantages of new technologies have gradually begun to play a strong communication charm, and gradually integrated into all aspects of life through effective supervision of the application of online interactive advertising [13]. As shown in Figure 2:

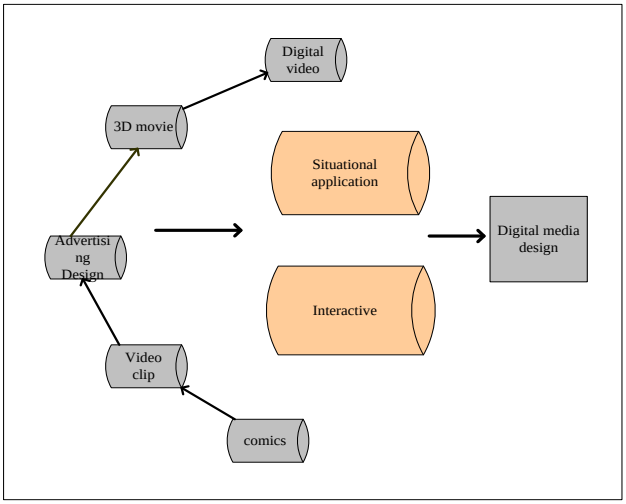


Figure 2. The development structure of digital media

As shown in Figure 2, with the mature development, mutual integration, and rapid popularization of computer technology, Internet technology, and wireless digital communication technology, the rapid rise of digital media has become possible [14]. Over time, they have gradually become the mainstream. Information and communication platforms are widely used. Especially with the development of wireless digital communication technology and the popularization of mobile terminals, the future development of digital media has shown a mobile trend, and digital communication media has begun to gradually replace traditional media.

**2.1 A Class of Stochastic Optimization Problems**

Stochastic optimization problem is to select the optimal solution according to some index from all possible alternatives of a problem. Mathematically speaking, optimization is to study the minimization or maximization of a given set.Random variables refer to the possible values of random variables, which can be divided into two basic types: discrete random variables are finite or countable in a certain interval.[15]. Purpose function or constraint function (including uncertain variables) includes uncertain function probability theory and mathematical planning method probability planning method. In actual production and life, interactive algorithms [16] are often used, as shown in Figure 3:

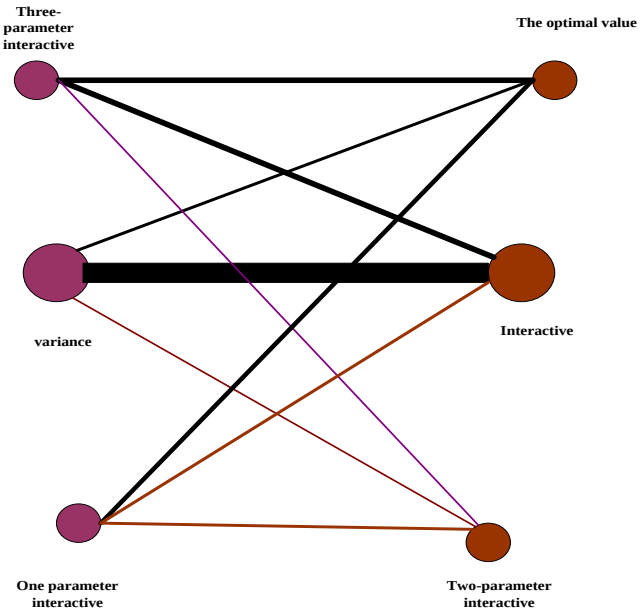


Figure 3. Interactive algorithm diagram

As shown in Figure 3: Uncertain variables appearing in system optimization decision-making can be divided into four basic types: probability variables, fuzzy variables, random variables and interval variables [17]. Function is an important mathematical model that describes the changing laws of the objective world. In high school, not only does the function as the dependency between variables, but also uses the set and the corresponding language to describe the function. The author has studied the following models, as shown in Formula 1 and Formula 2, and Formula 3:

$$M\inf(y)=\frac{1}{2}y^{t}D(w)y \tag{1}$$

$$Mayg(y)=C(w)y \tag{2}$$

$$s.tA(w)y\geq b(w) \tag{3}$$

Where e is a t-dimensional random variable $C(E)=(C_i(E))$, $i=1,2,...,n$, $Mayg(y)=C(e)y$. In this paper, by using the method of calculating the expected value of the objective function and constraint conditions, the next decisive equivalent class of the original problem is Formula 4:

$$MinE(F(Y))=\frac{1}{2}y^{T}E(D(e))y \tag{4}$$

In probability theory and statistics, expected value (or mathematical expectation, or mean value, also called

expectation in physics) refers to the probability of each possible outcome in a discrete random variable experiment multiplied by its outcome sum. But the best solution obtained by this method is only the best in the average sense, so the stability of the solution is generally the same. In this paper, the distributed expected value synthesis method [18] is proposed. The purpose is to ensure the stability of the best solution while optimizing the average value of the solution. In addition, this chapter will also learn practical interactive algorithms. Solutions to solve and optimize such problems not only reflect the satisfaction of decision makers, but can also be firmer. Numerical experiments verify the effectiveness of these methods.

**2.2 Two-parameter Interactive Algorithm:**

Assume that the values of the parameters $\rho$ and $\mu$ are continuous, and $0 \prec \mu \prec 1.\ \rho_{\min} \le p \le \rho_{\max}$, where $\rho_{\min}$ and $\rho_{\max}$ are the minimum and maximum values of t given by the decision maker. Let $\rho$ and $\mu$ vary by agreed amplitude, and there are count variables t.h, such as formula 5 and formula 6:

$$Min\frac{1}{2}\left(\mu_0+\Delta\mu^t\right)y^tQy+\frac{1}{4}\left(1-\mu_0-\Delta\mu^t\right)\left(y^2\right)^t \tag{5}$$

$$\sum_{i=1}^{n}E\left(C_I(W)\right)y_i \ge \left(\rho_{\min}+\Delta p^h\right) \tag{6}$$

Consider the following model formula 7:

$$\sum_{j=1}^{n}E\left(a_{ij}(w)\right)y_j \ge E\left(B_I(w)\right) \tag{7}$$

In actual production and life, there are uncertainties in many factors such as the rate of return of securities, the amount of consumer demand for specific commodities, and the market supply of specific commodities. The uncertainty optimization model is used to explain the optimization problem. Moreover, the interactive method is one of the current hotspots in application research [19].

**2.3 Transform the Model Using the Expectation of Variance Synthesis Method**

The mean is a statistic (statistics of observation samples), and expectation is a concept of probability theory and a mathematical feature. First, the definition formula is given, and the corresponding expectation method is as follows [20]. Using this method, special analysis experiments can be eliminated and the accuracy of the analysis results can be improved. As shown in Equation 8:

$$M_{in}f(y)=\frac{1}{2}y^tD(W)Y \tag{8}$$

Then, considering that the expected method can reflect the average level of the best solution, dispersion may reflect the stability of the best solution. Expectation is expressed by $E(\bullet)$, variance is expressed by $\sigma(\bullet)$, and parameter $\mu(0 \prec \mu \prec 1)$ expresses the weight of average level and stability. The above single-purpose probability optimization problem will be transformed into the next decisive problem solution. As shown in formula 9:

$$Min\mu E\left(\frac{1}{2}Y^TD(w)y\right)+(1-\mu)\sigma \tag{9}$$

Use $D(w)=\left(d_{ij}(w)\right)_{n\times n}$ to represent the expectation matrix R of the random matrix to represent the variance matrix of the matrix, as shown in formula 10:

$$Q=E\left(D(w)\right)=E\left(d_{ij}(w)\right)_{n\times n} \tag{10}$$

The hybrid method is applied to solve the multi-objective stochastic programming problem in the securities market. When considering the simple dual-objective stochastic programming model for securities mentioned in the previous section to solve the dual-objective stochastic programming problem that appears in the securities market, it is necessary to introduce the decision-maker to the expected probability level of the rate of return that meets a certain condition and introduce the parameter powder to represent the decision-maker. The expected

probability level of the first constraint condition should be met using the hybrid method [21]. Then the original model can be transformed into the following model as Equation 11:

$$\sum_{I=1}^{n} E\left(c_i(w)\right)y_i \tag{11}$$

The interactive algorithm of multi-functional optimization technology optimizes multiple sub-objects at the same time. Generally speaking, it is more difficult to achieve the minimization of a certain sub-purpose, which leads to the degradation of other sub-purposes or certain sub-purposes [22]. In other words, "making mutual concessions to obtain the best solution more suitable for each objective function value." As shown in Equation 12:

$$a_{IJ}(w) \sim N\left(\mu_{ij}, \sigma^2\right) \tag{12}$$

Where $N\left(\mu_{ij}, \sigma^2\right)$ represents the mean value $\mu$, the above model is transformed into the following formula 13:

$$Min\frac{1}{2}\mu y^t Qy + \frac{1}{4}(1-\mu) \tag{13}$$

Invoke the above-mentioned method of deriving the decisive equivalence class of the multi-purpose probability optimization problem called the scatter expectation synthesis method. Interactive planning algorithm is a kind of method to solve multi-objective programming problem, which refers to a kind of method to solve multi-objective programming problem through the interaction of the solution of the analyst and the decision of the decision maker [23]. This can ensure the stability of the solution.

**2.4 Interactive Algorithm For Two Parameter**

When transforming the model using the desired dispersion synthesis method, the total value of the two parameters $\rho$ and $\mu$ is imported. The values of these two parameters are provided by the decision makers according to their wishes [24]. Only parameters designed a new interactive algorithm, it can consider the hope of the decision maker at any time, and obtain the best solution that satisfies the decision maker. The calculation steps of the algorithm are shown in Equation 14.

$$P\left(\sum_{I=1}^{N} C_i(w)y_i \geq \rho\right) \geq \eta \tag{14}$$

Let Q denote the random matrix $D(w) = \left(d_i(w)\right)$, then the above model can be transformed into formula 15:

$$N = \sqrt{\sum_{I-1}^{N} \sigma\left(c_i(w)\right)y^2} \tag{15}$$

Where $N\left(\mu, \sigma\right)$ represents the mean value of $\mu$ normal distribution, then the above model is transformed into the following formula 16:

$$M + \Phi^{-1}(1-\eta)N \geq \rho \tag{16}$$

Through the above transformation, a new deterministic equivalence class of the original problem is obtained. The interactive algorithm of this model is given below. In this part, for the three parameters in the model, design related interactive algorithms in order to get the optimal solution of the problem. In this section, the average value of the best solution of the sample model is obtained through numerical experiments [25]. Next, compare the average value obtained by using the three methods and the distance of the best solution, solve the model, and compare the advantages and disadvantages. Substituting the data of each random variable of the hypothetical model into the deterministic model obtained by using the expectation method, the variance expectation synthesis method and the hybrid method, and the optimal solution obtained is Equation 17:

$$\sum_{i=1}^{N} y_i = 1 \tag{17}$$

The return rate of each stock is not a fixed value, and its size changes with time. The rate of return of stocks can be regarded as a random variable. Assuming that the rate of return of stocks obeys a normal distribution $\mu$,

the model can be further transformed into formula 18:

$$E\left(R^t y\right)+\Phi^{-1}(1-\eta)\sqrt{\sigma\left(R^t y\right)} \geq \rho \tag{18}$$

The above model has three parameters, and decision makers can choose the value of parameter $\mu$, $\rho$, $\eta$ according to their own requirements. After the value of the parameter $\mu$, $\rho$, $\eta$ is determined, the model will be transformed into a deterministic model. Numerical experiments show that the designed interactive algorithm can find the best solution of the model on the basis of reflecting the satisfaction of decision makers. Next, a hybrid method to solve this multi-purpose probability optimization problem is proposed. The corresponding interactive algorithm of the distributed expectation synthesis method will also be proposed for the parameters related to the problem. As shown in Equation 19 and Equation 20:

$$\sum_{J=1}^{N} \mu_{ij} y_j \geq \mu_{i0} \tag{19}$$

$$R=\sigma(D(w))=\left(\sigma\left(d_{ij}(w)\right)\right) \tag{20}$$

The study of probabilistic optimization problems can help solve optimization problems using probabilistic variables, and help to obtain solutions that satisfy decision makers. Excellent solutions help to study probability optimization problems in real problems. When solving probabilistic optimization problems, algorithms are proposed, which also make great contributions to other areas of society, and promote the development and mutual integration of various fields.

### 2.5 Application of Digital Media Patterns in Virtual and Real Scenarios

Digital media belongs to the category of engineering discipline, which refers to the information carrier of the process of recording, processing, dissemination and acquisition in the form of binary numbers. These carriers include digital text, graphics, images, sounds, video images, animation and other sensory media.Now, in the era of digital media patterns, digital media advertising has become a core element of Chinese cultural industry, and it is creative and pioneering that cannot surpass other forms of advertising. In the wave of Chinese rapid economic development, Chinese digital media advertising occupies a core position in many industries. With the advent of the digital age, the integration of the three major media and information fields, including computers, communications, and broadcasting, has formed an industry integration phenomenon based on digital interaction and digital media convergence. Chinese digital media-related industries such as movies, television, games, the Internet, animation, and electronic publishing have flourished. The digital media creative industry and the country's economic development have formed a close relationship of interdependence and mutual promotion. As shown in Figure 4:

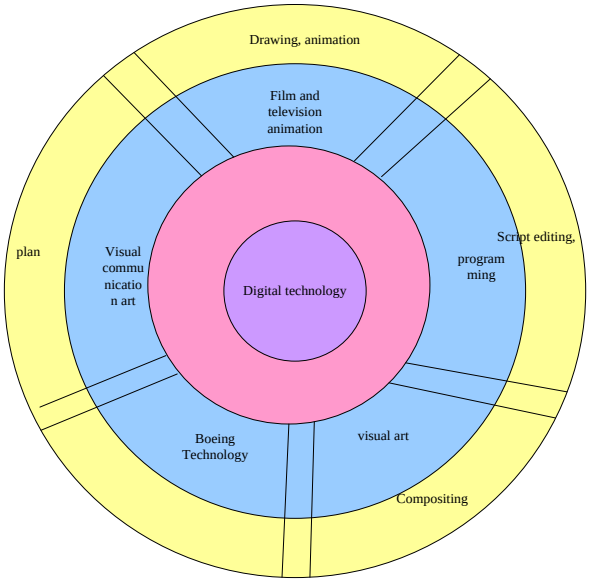


Figure 4. Digital media creative industry map

As shown in Figure 4, the rapid development of technology, social economy, culture, and art has made people truly realize the importance of digital media pattern technology. Digital media technology is an emerging technology with the development of information technology and communication technology. It is mainly used for audio and video transmission and conversion. In a sense, it subverts the concept of traditional media and makes people's cognition and life enter a new era. Compared with traditional media, digital media technology not only has more diversity in forms of expression, but also has advantages in media production and transmission efficiency.The influence of the integration of computer technology and communication methods produces greater visual energy and enhances our perception. Moreover, acceptance methods and capabilities will soon expand. The internal driving force of the prosperity of visual culture comes from the visual needs of human instinct. While creating image culture, human beings are also bound by image culture.

### 2.6 Realization of Virtual Reality

The realization of virtual reality depends on people's attention and dedication to the appreciation of digital media art work and the perception of immersion (including vision, hearing, touch, perception of power, perception of movement, perception of taste, etc.). When the appreciator focuses on appreciating, combining the appreciator's consciousness with the virtual reality produced by the work can achieve a state of selflessness and desirelessness. This kind of selflessness actually ignores the objective world. When the audience's consciousness is completely invested in virtual reality, the audience is temporarily unable to realize the objective reality. As shown in Figure 5:

Figure 5. Realistic picture of virtual scene

As shown in Figure 5, the realization of virtual reality is actually the physical liberation and spiritual travel of the audience. Of course, not all works of art can provide people with a perfect virtual experience. On the one hand, it depends on whether the audience's attention is fully concentrated, on the other hand, it depends on the artistic charm, display form and effect. The powerful virtuality of digital media art stems from its real audiovisual effects, which realize three-dimensional images and sounds. This visual effect is close to the laws of the objective world and strengthens the experience of transcending the objective world. For example, through the excellent three-dimensional image effects and real image generation of the 3D movie "Avatar", the fantasy world presented in front of you will become "reality". The characters and scenes in the movie are based on the designer's vision of objective laws, and they do not exist in reality. They only use images with the characteristics of a virtual domain to express.

## 3. Experiment Results and Analysis

Substituting the data into the model obtained by the expected value $a=(2.2,0,1,0)^T$ , and by substituting the data into the model obtained by the expected value dispersion synthesis method, the optimal solution $a=(1.564,1.343,0.543,0.765)^T$ of the model can be obtained. The best solution to solve the model is shown in Table 1:

Table 1. Table of best solutions to solve the model

| $(\mu,\rho)$ | $a$ | $(\mu,\rho)$ | $a$ |
|---|---|---|---|
| (0.56,30) | (1.45,0.86,4.43) | (0.1,31) | (2.45,0.36,0.43) |
| (0.23,34) | (2.05,0.21,0.65) | (0.2,40) | (1.34,0.46,4.43) |

| | | | |
|---|---|---|---|
| (0.41,55) | (1.35,0.46,4.33) | (0.3,35) | (1.45,0.89,3.42) |
| (0.52,56) | (1.47,0.88,4.49) | (0.4,33) | (1.26,0.46,1.56) |
| (0.62,60) | (1.41,0.76,3.75) | (0.5,32) | (1.36,0.54,1.53) |
| (0.47,45) | (2.15,0.16,4.23) | (0.6,20) | (1.87,0.36,1.59) |
| (0.87,46) | (2.35,0.81,4.23) | (0.7,10) | (1.36,0.43,1.76) |
| (0.32,42) | (1.54,0.87,5.40) | (0.8,22) | (1.56,0.76,1.89) |

It can be seen from Table 1 that when $\mu,\rho$ takes different values, the optimal solution of the corresponding model has different values. Therefore, in the two-parameter interactive algorithm, according to the wishes of the decision maker, by adjusting the size of the parameter $\mu,\rho$, and by analyzing 13 survey data objects, various optimal solutions can be obtained. By executing the interactive algorithm with two parameters, the optimal solution that satisfies the decision maker can be obtained. As shown in Figure 6:

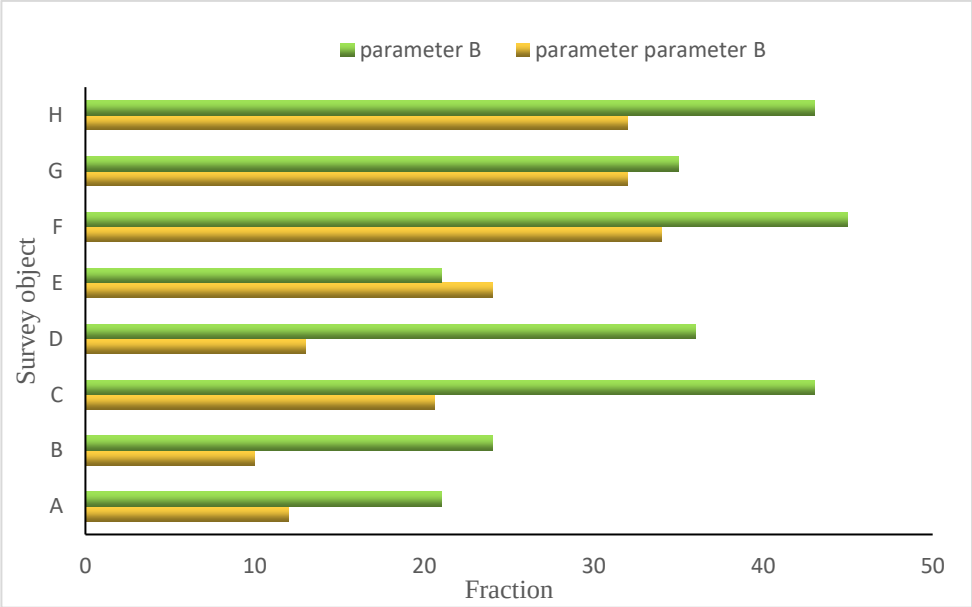


Figure 6. Optimal solution statistics chart

As shown in Figure 6: Solve the above model with LINGO, the abbreviation of LINGOLinearInteractiveandGeneralOptimizer, that is, "interactive linear and general optimization solver", launched by the American LINDO system company (LindoSystemInc.). It can be used to solve non-linear programming, and can also be used to solve some linear and non-linear equations, etc. It has very powerful functions, and get the optimal solution of the model as $a=(3.4,1,1.87,2.34)^T$, and use the expected value method to obtain the optimal solution of the number of functions. If the above data is substituted into the decisive model obtained by using the expected value method, the optimal solution of the model can be obtained as follows: $a=(2.32,3.23,1.87,3.34)^T$, if the value of $\mu,\rho$ is changed, the influence of their size on the optimal solution of the model can be known. The results of the numerical experiment can be seen in Table 2:

Table 2. Numerical experiment table of the influence of parameter size on the optimal solution of the model

| $(\mu,\rho,\ \eta)$ | $a$ | $(\mu,\rho)$ | $a$ |
|---|---|---|---|
| (0.51,31) | (1.45,0.86,4.43) | (0.1,31) | (2.45,0.36,0.43) |
| (0.23,32) | (2.05,0.21,0.65) | (0.2,40) | (1.34,0.46,4.43) |
| (0.31,55) | (1.35,0.46,4.33) | (0.3,35) | (1.45,0.89,3.42) |
| (0.42,56) | (1.47,0.88,4.49) | (0.4,33) | (1.26,0.46,1.56) |
| (0.62,62) | (1.41,0.76,3.75) | (0.5,32) | (1.36,0.54,1.53) |
| (0.47,45) | (2.15,0.16,4.23) | (0.6,20) | (1.87,0.36,1.59) |

| | | | |
|---|---|---|---|
| (0.87,46) | (2.35,0.81,4.23) | (0.7,10) | (1.36,0.43,1.76) |
| (0.16,31) | (1.26,0.46,1.56) | (0.8,11) | (1.87,0.45,1.98) |
| (0.62,20) | (1.36,0.43,1.76) | (0.9,20) | (1.67,0.63,1.87) |
| (0.42,33) | (1.87,0.36,1.59) | (1.0,34) | (1.56,0.54,1.57) |
| (0.51,32) | (1.45,0.89,3.42) | (1.2,10) | (1.46,0.53,1.65) |
| (0.87,46) | (1.36,0.43,1.76) | (1.3,14) | (1.36,0.78,1.78) |
| (0.47,56) | (1.26,0.46,1.56) | (1.5,18) | (1.54,0.86,1.79) |
| (0.23,67) | (1.45,0.67,1.78) | (1.6,24) | (1.67,0.89,1.55) |

It can be seen from Table 2 that when $(\mu, \rho, \eta)$ takes different values, the corresponding optimal solution of the model has different values. Therefore, in the three-parameter interactive algorithm, according to the wishes of the decision maker, by adjusting the size of the parameter $(\mu, \rho, \eta)$, different values can be obtained. The optimal solution of the three-parameter interactive algorithm can be executed to obtain the optimal solution that satisfies the satisfaction of the decision maker.

In this paper, the average value of the best solution of the sample model is obtained through numerical experiments, the average value obtained by the three methods and the distance of the best solution are compared to solve the model. Conceptual synthesis theory believes that the human thinking mode is not directly, one-way and absolute mapping between the source domain and the target domain, but uses the shared mental schema as the generic space, and the two input spaces of the source domain and the target domain are bidirectionally mapped to the composite space. Dynamic integration process and the hybrid method. As shown in Figure 7:

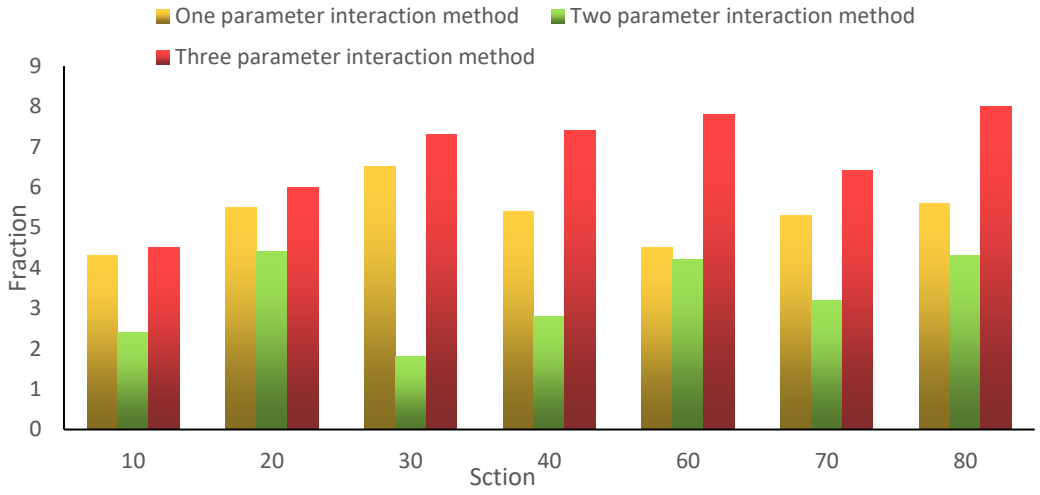


Figure 7. Statistical graph of determinism model

As shown in Figure 7, the smaller the distance between the mean value of the sample's optimal solution and the model's optimal solution, the better the method used to solve the model. It can be seen that the hybrid method is better than the expected variance synthesis method, and the expected variance synthesis method better than expected method.

This paper compares the advantages and disadvantages of the three methods from the viewpoint of the best solution of the model and the degree of violation of the model constraints. The comparison method is to generate 10 sample values of all random parameters by numerical simulation, and use three methods to solve them. The optimal solution of the model. As shown in Table 3:

Table 3. Three methods to solve the model's optimal solution table

| Sample | $Y_1$ | $t_1$ | $Y_2$ | $Y_2$ | $Y_3$ |
|---|---|---|---|---|---|
| 1 | (0.59,0,30) | 0 | (0.45,0.86,4.43) | (0.1,31) | (2.45,0.36,0.43) |
| 2 | Unsolvable | 1 | Unsolvable | (0.2,40) | (1.34,0.46,4.43) |
| 3 | (0.41,0,55) | 2 | (0.35,0.46,4.43) | (0.3,35) | (1.45,0.89,3.42) |
| 4 | (0.52,56) | 6 | (0.47,0.88,4.48) | (0.4,33) | (1.26,0.46,1.56) |
| 5 | Unsolvable | 3 | Unsolvable | (0.5,32) | (1.36,0.54,1.53) |
| 6 | (0.47,0,45) | 2 | (0.15,0.16,4.34) | (0.6,20) | (1.87,0.36,1.59) |
| 7 | (0.87,0,46) | 0 | (0.35,0.81,4.26) | (0.7,35) | (1.36,0.43,1.76) |
| 8 | Unsolvable | 4 | Unsolvable | (0.9,67) | (2.45,0.36,0.43) |
| 9 | (0.43,0,89) | 3 | (0.36,0.51,4.27) | (0.8,43) | (2.45,0.36,0.43) |
| 10 | Unsolvable | 0 | Unsolvable | (0.6,43) | (2.45,0.36,0.43) |
| 11 | (0.65,0,49) | 1 | (0.54,0.56,4.87) | (0.7,10) | (2.45,0.36,0.43) |

It can be seen from Table 3 that the best solution obtained by using the expected value method to solve the model has the maximum constraint violation degree corresponding to the model constraints, and the best solution obtained by the scattered expected value synthesis method corresponds to a smaller degree of violation. The hybrid method corresponds to the minimum limit violation degree. The smaller the violation degree, the better the method used to unlock the model. According to this, the hybrid method is better than the expected dispersion synthesis method and is the expected method.

For a long time, the art of virtual and real sceneries has been closely linked with science and technology, and the technological level of different times has directly affected the way of expression of the art of virtual and real sceneries. All this is reflected in the transformation of the visual effects of virtual and real scene art brought by digital media art under the technical support. Not only must inherit the essence of virtual and real scene art, but also thoroughly learn and master the digital media art and its application in virtual and real scene art. But it also puts an unprecedented digital technology requirement on creators. Of course, in this era of rapid technological development, we must always base ourselves on the essence of art. On this basis, this thesis starts to explore and research the art and media of virtual and actual scenes. This article investigates the trends in the use of company A and B's digital media patterns in virtual and real situations in 2019 and 2020. As shown in Figure 8:

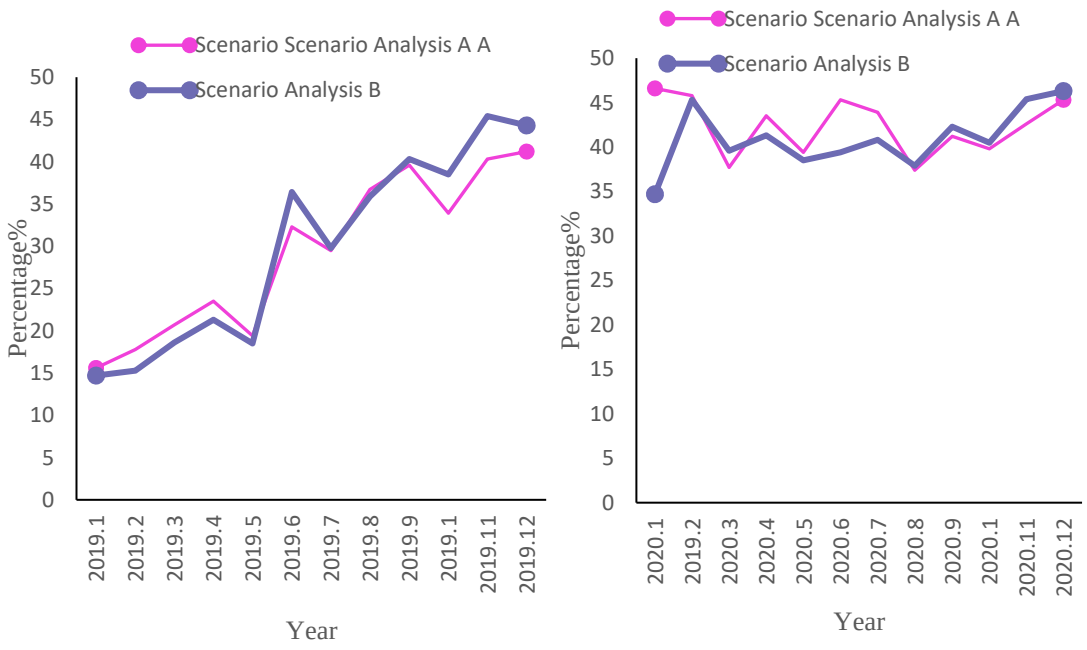


Figure 8. Comparison line chart of the use of company A and B's digital media patterns in virtual and real situations in 2019 and 2020

## 4. Discussion

This article mainly introduces the relevant theories and technologies of digital media patterns. The development of digital media will shift from being communicator-centered to audience-centered. Digital media will become a multimedia information terminal that integrates public communication, information, services, culture and entertainment, and communication and interaction. As well as the theoretical knowledge of various aspects of virtual and real scenario analysis and design.

Finally, the research results are proved through actual cases, and the importance and advantages of virtual and real scenario analysis design in the digital media environment are summarized.

Based on the introduction of sandstone relief murals related knowledge, and based on metal matrix composite materials, this article studies how the wear resistance of metal matrix composites can play a role in the construction of sandstone relief murals and how to reduce costs. It can be affordable and can extend the life of the work. This article also uses the variance expectation synthesis method and interactive algorithm, combined with the relevant theories and technologies of digital media patterns, and learns how to play a role in the analysis and design of virtual and real scenarios by analyzing the application of relevant theories and technologies of digital media patterns.

Through the experiment and analysis of the interactive algorithm and the distance comparison between the optimal solutions, this thesis found that the relevant theories and technologies of digital media patterns have a great effect on the design of virtual and real scenarios. Therefore, it is necessary to rationally and scientifically play the role of digital media patterns in virtual and real situations.

## 5. Conclusions

Based on the elaboration of the relevant theories and technical theoretical knowledge of digital media patterns, and the role of relevant theories and technologies of digital media patterns, this paper establishes that the relevant theories and technologies of digital media patterns can play a great role in the analysis and design of virtual and real scenarios. Through the selection of various evaluation methods, this paper chooses the variance expectation synthesis method and the interactive algorithm, and uses various algorithms to determine the role of digital media pattern technology. How to make digital media patterns play a role in the analysis and design of virtual and real scenarios has become the focus of this article. In the experimental analysis, the interactive algorithm and the distance comparison between the optimal solutions are tested. Finally, it can be seen that the hybrid method is better than the expectation of variance synthesis method and better than the expectation method. According to the questionnaire survey, the trend of adopting digital media pattern technology in the market has been on the rise in recent years. Therefore, digital media pattern technology should be used in the design of virtual and real scene analysis. Due to the author's limited research level and ability, this article still has certain deficiencies in the content, and further research is needed.

## Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The authors declare no conflicts of interest

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project number：2021XJ06

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