Hindawi
Mobile Information Systems
Volume 2022, Article ID 2203259, 12 pages
https://doi.org/10.1155/2022/2203259

Research Article

Performance Characteristics of Digital Media Art Design Relying on Computer Technology

Weina Ye[1] and Yuhui Li[2]

[1]*School of Architecture and Art, Zhejiang Business Technology Institute, Ningbo 315012, China*
[2]*School of Design, NingboTech University, Ningbo 315100, China*

Correspondence should be addressed to Yuhui Li; 10824022@zjbti.net.cn

Received 24 February 2022; Revised 24 April 2022; Accepted 26 April 2022; Published 20 May 2022

Academic Editor: Hye-jin Kim

Research Purposes. The performance characteristics of traditional digital media art have been gradually accepted by people, which is not innovative enough for people, so this paper mainly studies the design performance characteristics of a new digital media art design relying on computer technology. *Research Method*. This paper analyzes the concept and characteristics of digital media art based on the relevant theory of computer, combined with computer-aided technology and IRT theory. This paper finally designs the digital media art form based on computer technology. This paper also designs the USB trace feature extraction experiment, computer technology development investigation, and experimental test, and finally optimizes by analyzing the data obtained from the experiment. In order to verify the difference between the representation designed in this paper and the traditional representation, this paper also designs a set of control experiments. *Research Result*. The results show that the expression of artistic creation based on the digital media art expression designed in this paper is 14.12% higher than that of the traditional artistic expression. However, the innovative effect of the artistic creation based on the digital media art expression designed in this paper is 20.27% higher than that of the traditional expression.

1. Introduction

With the development of computer and network technology, the impact of the Internet on human production and life is unprecedented. Network media as new media appeared on the stage of history, and its technical mode and communication mode have great benefits. The birth of media in any era has its profound social roots, and the society needs to continuously improve and develop communication technology. Because a large amount of information and data are frequently involved in the operation of various computer-aided systems, the database management system is also an important part of them, even the core part. However, the more mature commercial database management systems often cannot meet their needs.

Based on the characteristics of the information age supported by today's computer network system technology, this paper focuses on the possibility of practical application of computer network technology in art and design education. This paper discusses how to develop influence and means in future art and design education papers in combination with the development process of art and design education and computer network technology. This article combines the development trend of art and design education with classroom teaching and network education, and the author proposes to build a new art model.

Computer-aided technology is a technology that uses computer as a tool to use computer in the process of product design, manufacturing and testing and assists people to complete tasks in specific application areas: theories, methods, and technologies. It includes various fields such as computer-aided design (CAD), computer-aided manufacturing (CAM), and computer-aided instruction (CAI). "Auxiliary" emphasizes the leading role of people, and the computer and the user constitute a closely interacting human-machine system. By studying the theory and auxiliary

technology of computer technology, combined with IRT theory and the connotation of digital media art, this paper designs a digital media art design expression form based on computer technology. This paper tests and optimizes this representation with a generative adversarial network model in deep learning.

2. Related Work

The recent rapid development of Internet-based computer technology has enabled many new radiation dose delivery applications. Emon introduced the background and concepts of some recent Internet-based computer technologies, such as cloud computing, big data processing, and machine learning. He then presented their potential applications in radiation therapy, such as treatment planning and dose delivery [1]. His determination of the place of musical computer technology in modern history requires a comprehensive consideration of musical processes and factors in the first half of the 20th century, as well as the study of related discoveries, concepts, and experiments in new musical technologies. The purpose of Kong is to systematically find out the development law and appeal of music art related to modern social life and to deeply study music of different styles and eras [2]. In Bulgaria, there are serious research and regulatory gaps to justify the need for digital media literacy, which corresponds to Modern Education 3.0, as well as the challenge of interpretation and creativity of different types, and it continues to innovate digital communication products in all areas of society. Peicheva and Milenkova aimed to "mapping" major theoretical efforts and applied practices promoting various aspects of digital media literacy, as well as exploring its dimensions and predictions in society [3]. Learner-Generated Digital Media (LGDM) has been incorporated into learning tools for evaluating students in higher education over the past decade. Reyna et al. had developed models for video production in the classroom that take into account technical knowledge, pedagogy, or a combination of both [4]. Descriptions of the digital future, whether optimistic or dystopian, are often built on three myths. Users are in charge, big data is neutral, and people will choose to live in enclaves. Webster described and challenges these myths. As an alternative, it establishes a dynamic model of the digital media market in which users, media, and metrics are constantly interacting. Finally, he argued that the structural characteristics of markets play an important role in shaping cross-media engagement and inviting readers to consider the power of media to reshape preferences [5]. With the development of consumer electronics and the use of mobile devices and tablets, the accessibility of these tools has changed, making them affordable to the general public. These technological advancements have changed the way we communicate, socialize, and learn. Fundamental to its effective communication using digital media is a set of design principles that most students are unlikely to be aware of. Reyna et al. built on their paper on the Digital Media Literacy Framework and Digital Taxonomy to study digital media technologies [6]. Today's young people are immersed in the world of digital media, and the effects of which are specific to their stage of development. However, this complex and reciprocal relationship does not match a simple linear description. The influence of digital media can be powerful. Research by Gerwin et al. suggested that it is important to be cautious but not overly pathological media use, as digital media can create social connections, allow some children to self-soothe, and satisfy the need for stimulation and self-expression [7]. To sum up, although the literature cited in this article is all about digital media and computer technology, most of them are at the level of theoretical research and have not entered into in-depth research, nor are they based on reality, and have little effect in practical operations.

3. Research Method

3.1. Computer Technology

3.1.1. The Development of Computer Technology. In 1971, the world's first email was invented by BBN [8, 9]. In 1974, the network protocol TCP/IP protocol was officially born. This is of great significance in the history of human information development. It enables different computers to exchange "packets" smoothly despite differences in clock speeds and packet sizes, which means that network communication is officially realized. In 1983, ARPAnet, which was originally only used for military purposes, further realized information interconnection and resource sharing, and the Internet immediately replaced ARPAnet [10]. The Internet entered a period of rapid growth in the 1990s as countless industrial and commercial enterprises participated in the Internet. At the end of the 20th century, computer network technology began a second leap. The application of computer technology is shown in Figure 1.

It is generally accepted that the general criterion for measuring social productivity is the use of labor tools. According to various labor tools, people divided the early social forms into the Paleolithic, Neolithic, and Iron Ages. It can be seen that labor tools play a role in people's lives. In the long history of continuous progress of human beings, the form of technology almost stipulates the basic form of people's life. In modern society, people even regard the development of technology as a measure of social civilization.

3.1.2. Computer-Aided Technology. The application of computer-aided technology [11, 12] in the design plays a pivotal role. The first is parametric design in computer-aided design. It can assist in adjusting and transforming various shapes after input parameters. Secondly, in computer-aided design, technologies such as automatic design software and automatic drawing are becoming more and more mature.

3.1.3. Overview of IRT Theory. In psychology, mental properties that limit people's actions are called mental properties. IRT uses tests to look for the psychological traits of the person being tested, which are also known as latent traits or abilities. The theory uses a mathematical way to describe the relationship between subjects' trait levels and their performance on items. It is based on strong assumptions and attempts to give a probabilistic basis for the measurement of unobservable traits. Compared with the CTT based on

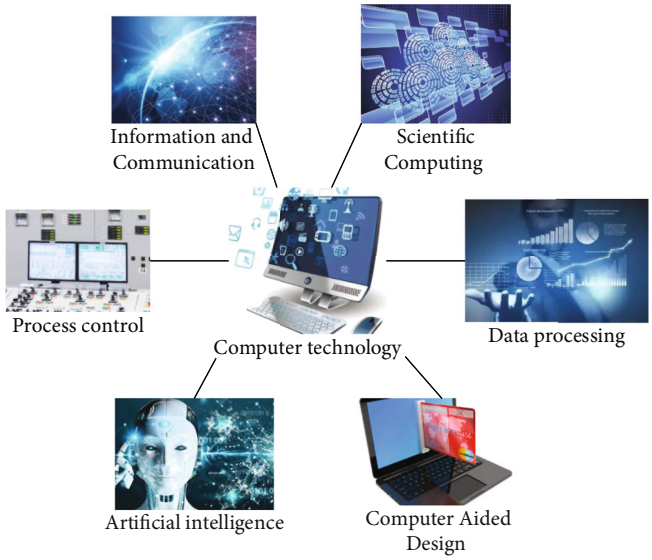


Figure 1: Application of computer technology.

the constant parameter model, it is named IRT [13], considering that it takes the project as the basic test unit. Figures 2 and 3 shows the three assumptions of the IRT theory.

Compared with classical measurement theory, IRT is based on strong assumptions, including the following:

(1) The unidimensionality assumption of ability

It is assumed that the ability variable is one-dimensional and can be represented in a scale. Therefore, the ability of different subjects can be compared, and this ability dimension is also called the latent trait space dimension.

(2) Local independence assumption

That is, the responses of the subjects to the test items are statistically independent. Participants' responses to one item did not affect their responses to other items. The joint probability of correct answer on all items is equal to the product of the probability of correct answer for each item

(3) Project characteristic curve assumption

The relationship between the correct rate of an object for a specific item and its ability can be represented by a monotonically increasing function. There are two types of models generally used: normal model and logical model.

(4) In addition, assumptions other than speed tests and assumptions of correct knowledge are included

In addition to the ability and characteristics of the test, it should be noted that the main factors affecting the test subject's response to the test items also include the test subject's cognition, personality, power level, test anxiety, and other measurement conditions. Therefore, one-dimensionality cannot be one-dimensionality in the strict sense.

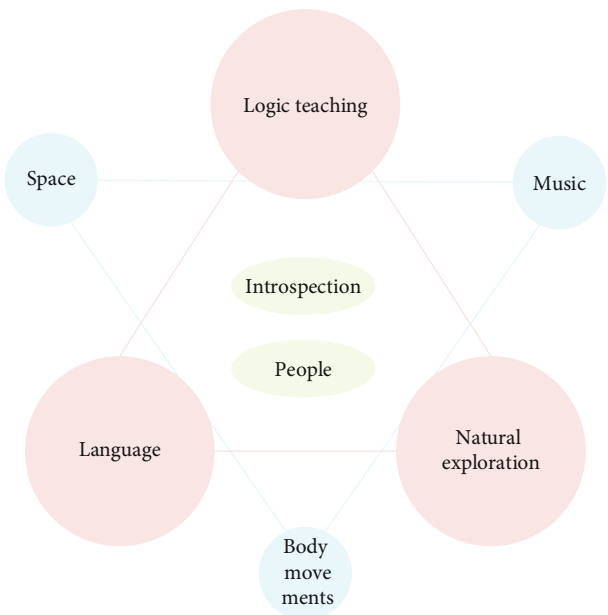


Figure 2: Three assumptions of IRT theory.

3.2. Digital Media Art Design. "Digital media art [14, 15] is a new interdisciplinary field that grows together from traditional art and industry, information technology and other scientific fields." Therefore, the field of digital media art education knows no boundaries. Its inherent absorption is not only reflected in schools, but also has great repercussions in society. Students can make use of social resources and solve problems only when they encounter problems. It implements education and learning, takes students as the center, actively develops students' personalities, and cultivates students' awareness of modern art and students' innovative quality.

Figure 3: Works of digital media art.

As a compound course developed for many years, the rise of digital media art education course also presents a grand occasion with the development of information technology. Digital image art, network art, 4D digital art, virtual reality, etc., are becoming more and more diverse [16]. From graphic design to three-dimensional design, from interface to content, it is a comprehensive form of artistic expression, including creative thinking, art appreciation, art criticism, and practical operation ability.

3.2.1. The Concept of Art Design and Art Design Education. Art design [17] is from the perspective of technology, economy, society, and culture, with the purpose of functional practicability and comfort. It uses specific materials and craftsmanship techniques, uses specific artistic means, and follows the laws of beauty. And its vision and planning are transformed into creative activities of practical products with specific use functions, external forms, human-machine relationship, and cultural significance.

Art and design education is an education that combines the basic theory and basic knowledge of art and design. It combines the cultivation of artistic design ability and design awareness. And it combines the training of art design techniques and design skills to cultivate a kind of innovative quality and sustainable development possibility, which integrates professional training form of design, creation, education, research, production, and management.

3.2.2. Overview of Digital Media Technology

(1) Digital Media. The digital media industry [18] refers to the industry that provides digital cultural products and cultural services to the society under the support of cutting-edge technologies such as digital technology, network technology, multimedia technology, computer graphics, and graphics, and its scope is shown in Figure 4. Digital media technology has become an integral tool in manufacturing, communication, and marketing for media, film, television, performance, entertainment, advertising, and other cultural industries.

Digital media art is a media art developed based on digital technology [19]. Digital technology uses computers as a basic tool and covers all contemporary art fields, from film, photography, music synthesis, compact disc, and more. The breakthrough of capabilities brought by digital technology gives images infinite scalability.

"Interaction" has become the most inclusive term to describe an art form in the digital age. The artist uses the interaction with the equipment to further create and inspire art on the personal equipment. Or it manipulates the interaction between the audiences of the art by participating in a preprogrammed process. It can also make automatic changes based on viewer commands or simple actions.

(2) Characteristics of Digital Media Art.

(1) Popularization of communication

Fundamentally speaking, since digital media art is an upgrade of traditional art, its origin belongs to popular culture. With the rapid development of the electronic information age in the 21st century, the dissemination of digital media art can play its unique advantages and spread to every corner of the life of every household and society. It is ubiquitously affecting our way of life, such as the rapid development of computers, TV sets, and the Internet, which deeply affects and depends on our life taste and aesthetic taste. For artistic pursuit, the creators of digital media art create a large number of art products and visual art cultural works with the help of the widely popular digital media tools, so as to meet the entertainment requirements and aesthetic tastes of the public. It can be seen that art has become more and more popular.

(2) Diversified performance

With the rapid development of digital information technology in the 21st century, digital media art works show a variety of artistic forms. This includes the digital art transformed by traditional art and the works of art based on digital technology, and they influence each other.

(3) Creation efficiency

The further development of high-tech and new technology has made the filming more convenient and tolerant. Nowadays, the digitalization of film photography and broadcasting systems, the birth of 3D film and television technology, and the rendering of images are easier to operate. This will be an important development direction of digital movies in the future, and its practical application will also deeply affect the process of future movie production and projection, and the audiovisual effect will be better [20, 21].

3.3. Deep Learning

3.3.1. Basic Concepts. Deep learning is to learn the inherent laws and representation levels of sample data, and the information obtained during these learning processes is of great help to the interpretation of data such as text, images, and sounds. Its ultimate goal is to enable machines to have the ability to analyze and learn like humans and to recognize data such as words, images, and sounds. Deep learning is a

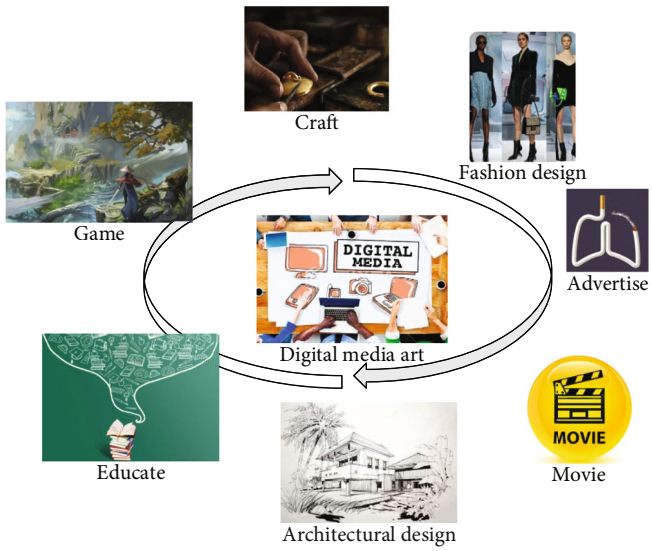


Figure 4: Digital media industry.

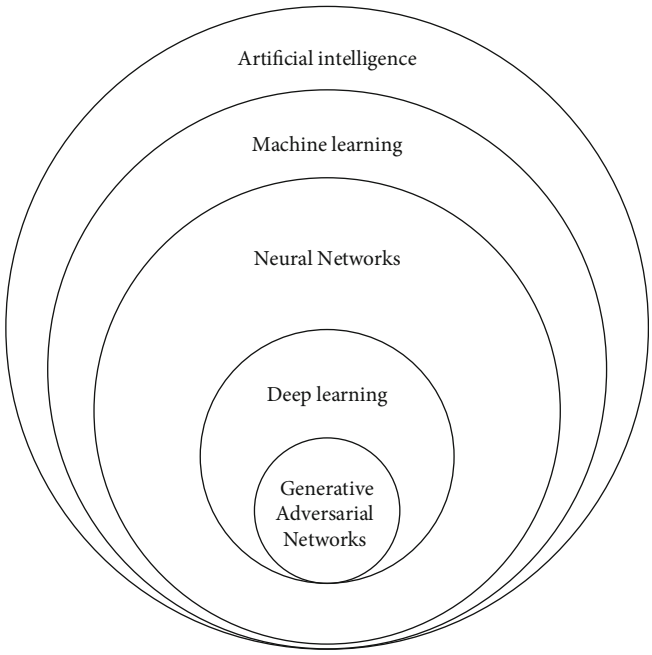


Figure 5: Diagram of related concepts.

complex machine learning algorithm that has achieved results in speech and image recognition far exceeding previous related technologies. The relationship between neural artificial intelligence, machine learning, neural network, deep learning, and generative adversarial network in deep learning [22] is shown in Figure 5.

In short, machine learning is the extraction of knowledge information from acquired data. Through obtaining, parsing, and understanding, it makes judgments and predictions on new unseen data. In the process of machine learning, through the two processes of data preparation and feature engineering, we find patterns in known data sets and use these patterns to judge or predict new data. At the heart of its process are machine learning algorithms. Machine learning refers to learning part of the data of the computer and predicting other data to make judgments. The process is similar to how people gain experience through learning in life. Deep learning is a function of machine learning that also includes generative adversarial network models.

3.3.2. Overview of Generative Adversarial Network Models. The basic network model structure of generative adversarial networks [23] is shown in Figure 6.

According to the number of generative models and classification models of different generated adversarial network

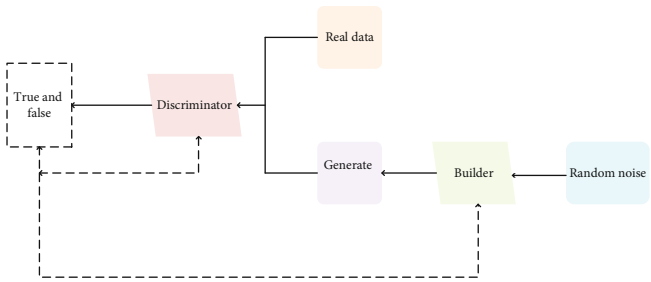
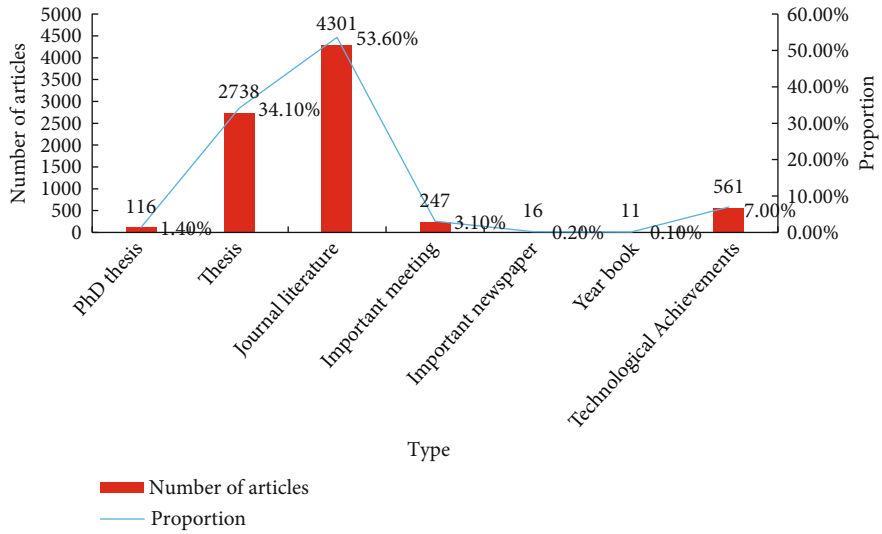
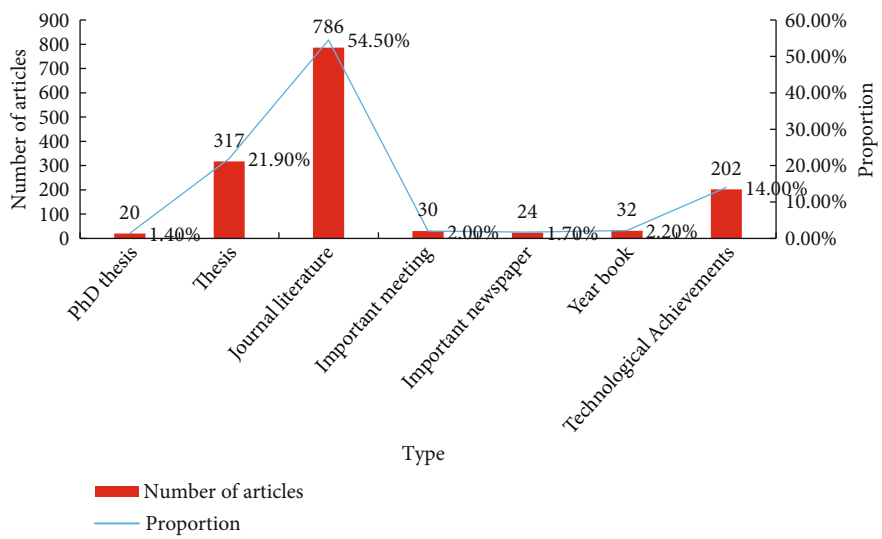


Figure 6: Basic structure of generative adversarial network.



(a) Literature information related to computer technology and its development from 1977 to March 2012



(b) Literature information related to the development of computer technology from 1993 to March 2012

Figure 7: Computer development survey results.

models, the generation methods of generating adversarial network images can be generalized into three categories: direct method, iterative method, and hierarchical method.

Direct method: the direct method uses the generator model and the discrete generator model, and the two constructs are directly connected together. Most of the initial GAN models belong to this category, such as GAN, DCGAN, Improved-GAN, InfoGAN, f-GAN, and GANINT-CLS [24]. Compared with the other two methods, this method is easier to implement.

Table 1: Hive file computer trace feature structure.

Owning data structure	Offset	Size (bytes)	Feature	Remark
HBIN	0 × 0000	0 × 0004	0 × 6E696268	Fixed character HBIN
HBIN	0 × 0008	0 × 0004	0 × 4000	Or an integer multiple of 0 × 4000
CM key_node	0 × 0000	0 × 0002	0 × 6B6E	Fixed character nk
CM key_node	0 × 0002	0 × 0002	0 × 2C or 0 × 20	Root key designation
CM key_value	0 × 0000	0 × 0002	0 × 6B6E	Fixed character vk

Iterative method: the essence of the iterative method is to use the generator with the same task and the same structure and iteratively generate images through the iterative method, which is a process from rough to detailed.

Hierarchical method: its essence is to divide the image into two parts, foreground and background, and use multiple discriminators and generators to complete the model and assign different tasks to each generator. The purpose of the completed tasks is also different.

(1) Mathematical Principles of Generative Adversarial Network Model. Generative adversarial network (GAN) model is a powerful generative model based on deep learning, which can be applied to important fields such as computer vision, natural language processing, and semisupervised learning. The most direct application of generative adversarial networks is data generation, and the quality of data is the key to judging the success of GAN. There are many mathematical formulas used in the generative adversarial network (GAN) model, which is convenient for the description. The following are the mathematical symbols that will appear.

Data: real data

Q_{data}: real data distribution

Q_g: data distribution after generator

The generative network and discriminative network can be represented by Q and P, respectively, where P can be regarded as a binary classifier. One of the principles of generative adversarial network models is KL divergence. KL divergence is an index to measure the similarity of two probability distributions. If the two are the same, the KL divergence should be 0. The smaller the KL divergence, the closer the two probability distributions are. For discrete probability distributions, the definitions are as follows:

$$S_{\text{KL}}(Q||P) = \sum_i Q(i) \log \frac{Q(i)}{P(i)}. \tag{1}$$

For a continuous probability distribution, it is defined as follows:

$$S_{\text{KL}}(Q||P) = \int_{-\infty}^{+\infty} Q(i) \log \frac{Q(i)}{P(i)}. \tag{2}$$

In addition, one of the key mathematical principles of generative adversarial network models is maximum likelihood estimation.

Table 2: Statistics of search results of image file content.

Test data	Accuracy (percentage)	Time consumption (seconds)
Group A	75%	1282
Group B	45%	1129
Group C	80%	329
Group D	45%	351

If the population A is discrete

If the distribution law is $Q\{A = a\} = q(a\,;\theta)$, θ is the parameter to be estimated, and $q(a\,;\theta)$ is the probability of occurrence of a when the estimated parameter is θ.

$$L(\theta) = L(a_1, a_2, \cdots, a_k) = \prod_{i=1}^{k} q(a_i\,;\theta). \tag{3}$$

If population A is continuous

Suppose the probability density is $f(a\,;\theta)$, and θ is the parameter to be estimated.

$$L(\theta) = L(a_1, a_2, \cdots, a_k) = \prod_{i=1}^{k} f(a_i\,;\theta), \tag{4}$$

where $L(\theta)$ is called the likelihood function of the sample.

When the sample value is $a_1, a_2, \cdots, a_k$

If satisfied,

$$L\left(a_1, a_2, \cdots, a_k\,;\widehat{\theta}\right) = \max_{\theta} L(a_1, a_2, \cdots, a_k\,;\theta). \tag{5}$$

That is to say, when the parameter $\theta = \widehat{\theta}$, the likelihood function can take the maximum value, and then, it is called the maximum likelihood estimate of $\widehat{\theta}$.

The sample value can be obtained by collecting the original data, and the data obtained by sampling is set as $a^1, a^2, \cdots, a^o$. Through these data samples, we can obtain the probability distribution function of multiple sample values. The likelihood function of the generative model can be obtained through the mentioned maximum likelihood estimation mathematical principle:

$$L = \prod_{i=1}^{o} Q_{\text{model}}\left(a^{(i)}\,;\theta\right). \tag{6}$$

Table 3: Statistics of the first search results.

Tool	TXT	Office 03	PDF	Office 07	Total number of files	Time consumption (min)
EvidenceToolkit 2012	21	128	90	93	332	37
This paper forensics system	56	128	106	93	383	28
Difference	35	0	16	0	0	9

Table 4: Statistics of the second search results.

Tool	TXT	Office 03	PDF	Office 07	Total number of files	Time consumption (min)
EvidenceToolkit 2012	17	35	57	7	116	35
This paper forensics system	22	41	57	7	127	32
Difference	5	6	0	0	11	3

In order to simplify the operation, now take the logarithm of all probability distribution functions and convert the continuous multiplication into addition.

$$\theta^* = \operatorname{argmax} \sum_{i=1}^{o} \log Q_{\text{model}}\left(a^{(i)}; \theta\right). \tag{7}$$

For the formula, the summation is approximated into the expected value, and then, the integral expression of the formula is obtained:

$$\theta^* = \operatorname{argmax} \log E_{x \sim \log Q_{\text{model}}} Q_{\text{model}}\left(a^{(i)}; \theta\right). \tag{8}$$

By adding an irrelevant constant term to the integral formula, the following derivation is further continued:

$$\theta^* = \operatorname{argmax} \int Q_{\text{data}}(a) \log \frac{Q_{\text{model}}\left(a^{(i)}; \theta\right)}{Q_{\text{data}}(a)}. \tag{9}$$

After the transformation, with the help of the definition of KL divergence,

$$\text{KL}(Q||P) = \int q(a) \log \frac{q(a)}{p(a)} da. \tag{10}$$

The integral formula can be transformed into the form of KL divergence:

$$\theta^* = \operatorname{argmax} \text{KL}\left(Q_{\text{data}}(a) || Q_{\text{model}}\left(a^{(i)}; \theta\right)\right). \tag{11}$$

$Q_{\text{model}}(a; \theta)$ can be obtained through the prior probability distribution:

$$Q_{\text{model}}(a) = \int_c^* Q_{\text{prior}}(c) I_{[G(c)=a]} dc, \tag{12}$$

where I represents the indicative function, and the expression is as follows:

Table 5: System trace scanning results.

Features	EvidenceToolkit 2012	This paper forensics system
Computer recording	57	57
HTTP logging	9	1457 articles
COOKIESRecord	44	3188
Windows 7 Jump List	Not available	838

$$Q_{\text{model}}(a) = \begin{cases} 0 & G(c) \neq a, \\ 1 & G(c) = a. \end{cases} \tag{13}$$

The global optimal solution of the generative adversarial network model is as follows:

$$q_g = q_{\text{data}}. \tag{14}$$

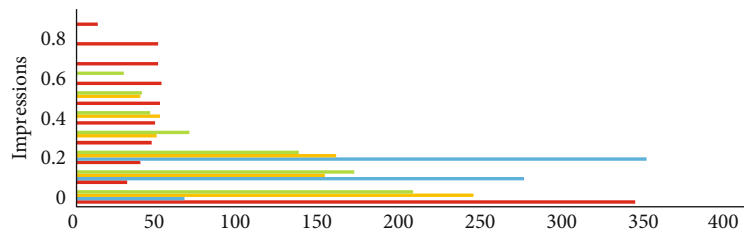
For a fixed generative model, the optimal discriminator in the generative adversarial network model is as follows:

$$S_G^*(a) = \frac{q_{\text{data}}(a)}{q_{\text{data}}(a) + q_g(a)}. \tag{15}$$

4. Experiment and Results

4.1. Investigation Results of the Current Research Status of Computer Technology Development Model. This chapter firstly investigates the research status of computer technology development model, secondly extracts computer trajectory features, and finally measures using different item selection methods and compares and analyzes the experimental results.

From the perspective of technology development history, the domestic research on computer technology and related development history was only 1-5 per year before 1994. Since 1994, the United States has allowed commercial capital to enter the World Wide Web, the speed of computer technology and industrial development has been greatly accelerated, and the related academic papers have gradually

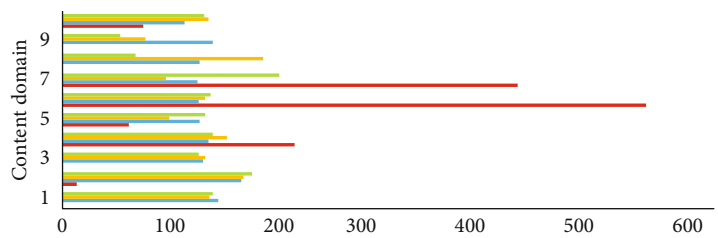


	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
TIS-SA project selection method	206	170	136	69	45	40	29	0	0	0
FB project selection method	243	152	159	49	51	39	0	0	0	0
Random item selection	66	274	349	0	0	0	0	0	0	0
Maximum information method	342	31	39	46	48	51	52	50	50	13

Number of projects

TIS-SA project selection method
FB project selection method
Random item selection
Maximum information method

(a) Project exposure comparison results



	1	2	3	4	5	6	7	8	9	10
TIS-SA project selection method	138	174	125	138	131	136	199	67	53	130
FB project selection method	135	166	131	151	98	131	95	184	76	134
Random item selection	143	164	129	134	126	125	124	126	138	112
Maximum information method	0	13	0	213	61	536	418	0	0	74

Number of projects

TIS-SA project selection method
FB project selection method
random item selection
maximum information method

(b) Content balance comparison results

Figure 8: Experimental results.

increased. Specifically, it is illustrated by two figures, as shown in Figure 7.

4.2. Computer Trace Feature Extraction Experiment. Most of the information of computer usage traces is stored in a specific key cell and has the characteristics of characteristic data format. By matching a specific key cell, the computer record can be extracted. Extract records with data structures, offsets, and features. These data are stored in the key cells of the Hive file, and each key cell belongs to an Hvin data block. The matching characteristics of computer traces are shown in Table 1.

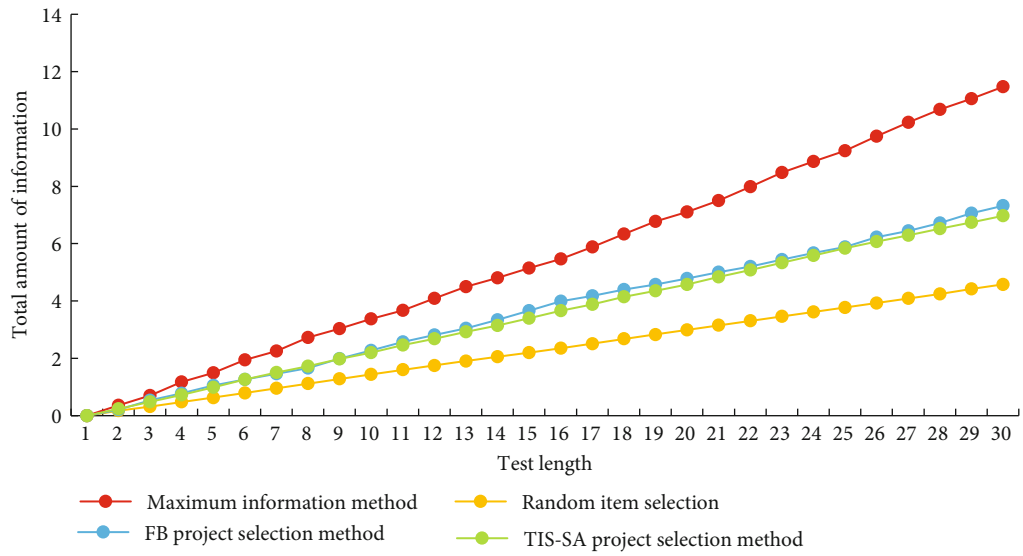
In the fast file content search function test, because most forensic software does not realize the integration of image content extraction and content search, only the performance test is performed for the image content search. In the nonimage content search test, the mainstream forensic inspection tool EvidenceToolkit 2012 will be used for comparison. The test results are counted, and the results are shown in Table 2.

The statistics of the results of the first search are shown in Table 3.

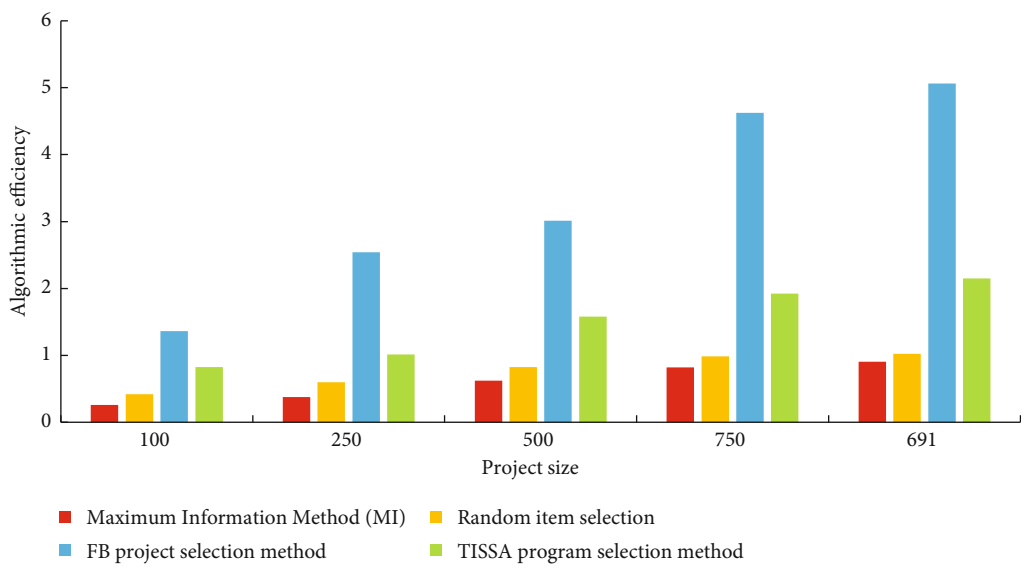
The statistics of the results of the second search are shown in Table 4.

The statistics of the test results are shown in Table 5. Due to the short running time of system trace acquisition, the time consumption is not counted in this functional test.

4.3. Experimental Test. In the experiment, this paper adopts different item selection methods for measurement. Based on the computer technology-assisted digital media art design



(a) Candidates test the amount of information under different item selection algorithms



(b) Algorithm efficiency comparison

Figure 9: Experimental test results.

method designed in this paper, it is compared and analyzed with the original method.

4.3.1. Measurement Accuracy. Measurement accuracy is an important indicator to measure the accuracy and validity of the subject's ability estimation. Standard deviation and standard deviation are used to measure the accuracy of the subject's ability estimation using different methods.

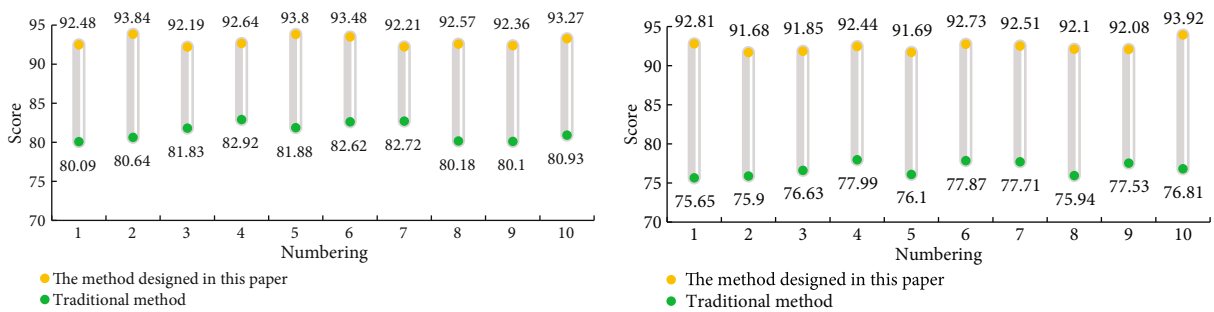
$$\text{Bias} = \frac{\sum_{o=1}^{N} \theta_i - \overline{\theta}_i}{N}, \tag{16}$$

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}\left(\theta_i - \overline{\theta}_i\right)^2}. \tag{17}$$

4.3.2. Project Exposure Control. In CAT, item exposure and test overlap are two commonly used metrics to track item exposure. Item exposure refers to the frequency with which items are used across all CAT tests, while test overlap refers to the proportion of items shared between tests (pairwise comparisons). Both monitor project exposure at the project and test levels, respectively.

(1) Project exposure

Project exposure is a very important indicator in CAT implementation. If the exposure rate of the project is not well controlled, it is easy to leak questions and affect the safety of the test. The following first explains the indicator and then compares and analyzes the four project selection methods.



(a) Expression score comparison

(b) Comparison of innovation effect scores

Figure 10: Comparison of experimental results.

Project exposure

$$r_i = \frac{T_i}{m}. \tag{18}$$

Among them, T_i is the number of times the item i is used; m is the number of candidates.

(2) Test the overlap rate

$$\bar{T} = \sum_{i=1}^{N} \frac{T_i(T_i - 1)}{L \times m \times (m-1)}. \tag{19}$$

Among them, T_i is the number of times the item i is used; m is the number of candidates; N is the size of the question bank, and L is the length of the test.

(3) Content balance

Figure 8 shows the comparison results of project exposure rate and the comparison results of MI, random project selection method, FB method, and TIS-SA four project selection methods on content balance.

(4) Average test length

And the average test length is expressed as follows:

$$\bar{L} = \frac{\sum_{i=1}^{m} L_i}{m}. \tag{20}$$

Among them, m is the number of candidates; L_i is the test length of the i-th candidate.

When the scale of item number is 100, 250, 500, 750 and 691, there will be four different selection methods and the use of selection time. The test length results for the same examinee are shown in Figure 9.

5. Discussions

In order to better analyze the method of digital media art expression based on computer technology designed in this paper, this paper analyzes the experimental results. This paper finally designs a digital media art form based on computer technology. In order to verify this form of expression, this paper designs a set of control experiments. One group was created using the computer-based digital media art representation designed in this paper, and the other group was created according to the traditional representation. Then, this article judges the pros and cons through the judges' scores. The experimental results are shown in Figure 10.

As can be seen from the figure, the expression of artistic creation based on computer technology-based digital media art expression designed in this paper has achieved a score of 92.88 points in the referee. In contrast, works created by traditional artistic expressions scored only 81.39 in the judges. In contrast, the expression score of the digital media art expression based on computer technology designed in this paper is 14.12% higher than that of the traditional art expression. The innovative effect of the artistic creation based on the digital media art form designed in this paper has reached a score of 92.38 in the judges. In contrast, works created by traditional artistic expressions scored only 76.81 points in the judges. In contrast, the innovative effect of the digital media art form based on computer technology designed in this paper is 20.27% higher than that of the traditional form of expression. To sum up, the digital media art form based on computer technology designed in this paper has a very significant improvement in the expression form and innovative effect of the creative works.

6. Conclusion

This paper mainly studies the performance characteristics of digital media art design relying on computer technology. So this paper starts with computer technology and studies computer-aided technology and IRT theory. Combined with the concept and characteristics of digital media art, this paper designs a digital media art expression method based on computer technology. This paper then tests this performance method with a generative adversarial network model in deep learning. This paper designs a USB trace feature extraction experiment and a survey of computer technology development. By analyzing the development of the computer, this paper finally carries out the experimental test. It analyzes the results of the experiment. This paper finally optimizes the designed digital media art expression method based on computer technology. This paper also designs a

control experiment with the traditional expression. The advantages of the digital media art expression method based on computer technology designed in this paper are verified by comparing with the traditional expression form. However, due to the limited research content and time of the author, the research on the performance characteristics of digital media art design needs to be further deepened.

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 that they have no conflicts of interest.

References

[1] M. B. Emon, "Study on construction delay and the factors of delay in construction project," *Journal of Logistics Informatics and Service Science*, vol. 5, no. 2, pp. 42–54, 2018.

[2] Z. Kong, "Musical thinking and composing technique in terms of computer technology development," *Culture of Ukraine*, vol. 5, no. 71, pp. 82–85, 2021.

[3] D. Peicheva and V. Milenkova, "Knowledge society and digital media literacy: foundations for social inclusion and realization in Bulgarian context," *Calitatea Vietii*, vol. 28, no. 1, pp. 50–74, 2017.

[4] J. Reyna, J. Hanham, and P. Meier, "A taxonomy of digital media types for learner generated digital media assignments," *E Learning & Digital Media*, vol. 14, no. 6, pp. 309–322, 2017.

[5] J. G. Webster, "Three myths of digital media," *Convergence*, vol. 23, no. 4, pp. 352–361, 2017.

[6] J. Reyna, J. Hanham, and P. Meier, "The internet explosion, digital media principles and implications to communicate effectively in the digital space," *E-Learning and Digital Media*, vol. 15, no. 1, pp. 36–52, 2018.

[7] R. L. Gerwin, K. Kaliebe, and M. Daigle, "The interplay between digital media use and development," *Child & Adolescent Psychiatric Clinics of North America*, vol. 27, no. 2, pp. 345–355, 2018.

[8] F. D. Wright and T. M. Conte, "Standards: road mapping computer technology trends enlightens industry," *Computer*, vol. 51, no. 6, pp. 100–103, 2018.

[9] S. Adeomokhai, "Organization performance and professional ethics in educational institute," *Journal of Logistics Informatics and Service Science*, vol. 6, no. 1, pp. 38–68, 2019.

[10] B. Johansson and T. Odén, "Struggling for the upper hand: news sources and crisis communication in a digital media environment," *Journalism Studies*, vol. 19, no. 10, pp. 1–18, 2018.

[11] S. Oklobdija and J. Popesku, "The link between digital media and making travel choices," *Marketing*, vol. 48, no. 4, pp. 75–85, 2017.

[12] R. M. Crotty, "Gabriele Balbi and Paolo Magaudda, a history of digital media: an intermedia and global perspective," *Mobile Media & Communication*, vol. 9, no. 1, pp. 151-152, 2021.

[13] R. Vanaga and B. Sloka, "Financial and capital market commission financing: aspects and challenges," *Journal of Logistics, Informatics and Service Science*, vol. 7, no. 1, pp. 17–30, 2020.

[14] Z. Sadílková, "Children and digital media," *Pediatrie pro Praxi*, vol. 21, no. 6, pp. 391–394, 2021.

[15] L. Ncube, "African language digital media and communication: edited by Abiodun Salawu," *Critical Arts*, vol. 34, no. 6, pp. 104–107, 2020.

[16] C. Arrieta and Y. G. Berdasco, "Brexit and female leadership in Spanish digital media from a linguistic perspective. the case of Theresa May's decline," *Communications Society*, vol. 33, no. 2, pp. 243–257, 2020.

[17] P. R. Obukoadata, N. E. Uduma, P. Eneokon, and J. Ulam, "Deploying digital media as innovations in marketing government policies and enhancing civic engagement among vulnerable youths in Calabar," *Media Watch*, vol. 11, no. 2, pp. 296–309, 2020.

[18] S. Zheng, "Chinese fans' patriotism creating quandary in the digital media era," *Galactica Media Journal of Media Studies*, vol. 2, no. 4, pp. 87–111, 2020.

[19] G. Penkowska, "Visual communication in the age of digital media," *Problemy Opiekuńczo Wychowawcze*, vol. 592, no. 7, pp. 29–36, 2020.

[20] R. Mekvabidze, "From business modeling to business management: an exploratory study of the optimal decision making on the modern university level," *Journal of Logistics, Informatics and Service Science*, vol. 7, no. 1, pp. 67–86, 2020.

[21] A. Burinskas and A. Burinskiene, "Application of Gordon's Growth Model for the transport sector of Lithuania," *Journal of Logistics, Informatics and Service Science*, vol. 7, no. 1, pp. 31–41, 2020.

[22] A. Orben and A. K. Przybylski, "Reply to: underestimating digital media harm," *Nature Human Behaviour*, vol. 4, no. 4, pp. 349–351, 2020.

[23] A. Rahman, "Challenges in privately joint-ventured project: a case study," *Journal of Logistics, Informatics and Service Science*, vol. 6, no. 2, pp. 90–107, 2019.

[24] Y. Wang, "Olympic games as a digital media product," *Marketing and Management of Innovations*, vol. 1, no. 3, pp. 306–318, 2020.