

Retraction

Retracted: Artistic Design Method of User Interaction Experience of Mobile System Based on Context Awareness

Security and Communication Networks

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Security and Communication Networks has retracted the article titled "Artistic Design Method of User Interaction Experience of Mobile System Based on Context Awareness" [1] due to concerns that the peer review process has been compromised.

Following an investigation conducted by the Hindawi Research Integrity team [2], significant concerns were identified with the peer reviewers assigned to this article; the investigation has concluded that the peer review process was compromised. We therefore can no longer trust the peer review process, and the article is being retracted with the agreement of the Chief Editor.

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Research Article

Artistic Design Method of User Interaction Experience of Mobile System Based on Context Awareness

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This work combines context awareness to explore the art design technique of user interaction experience of mobile system and alters the conventional art communication and art appreciation methods in order to increase the impact of artistic interactive experience. Furthermore, this paper proposes that the spatial pattern will influence the aggregation value in wireless sensor networks, as well as the influence of the pattern of single-point extrapolation function and information coverage function measurement, which is quantified as a nonsampling error in sampling theory. Then, this paper proposes a hierarchical sampling theory to optimize the nonsampling error and improve the effect of artistic situation perception. Finally, on this basis, this paper constructs an art design system of context awareness and interactive experience. The findings of this study indicate that the state-of-the-art mobile system user interaction experience based on context awareness suggested in this work has a strong context awareness effect and user interaction experience.

1. Introduction

Context awareness is the process of perceiving, acquiring, processing, and feedback on context parameters in a pervasive computing environment. In terms of application, context awareness also has great potential for development. Currently, context awareness is mostly combined with virtual reality technology [1].

"Interaction" means communication and interaction. Through a service platform with interactive functions, it assists users to obtain relevant information or provide services, and a series of ideas, needs, and inspirations burst out in the process [2]. The computer industry first proposed and applied the concept of interaction. After a long period of development, it has become an interdisciplinary research object composed of psychology, informatics, engineering, sociology, anthropology, and other disciplines. Once the system program software is started, it does not rely on a single program to perform tasks. The programmers in front of the computer may use information instructions and code compilation to implement the operation and maintenance of the programme software. The interactive activity [3] refers to the system program's real-time reaction to commands specified by the programmer in advance. To put it another way, the items involved in the action may interact with one another from both sides. Many Internet sites are presently seeking interaction as a feature.

"Interactive experience" is the user's experience and overall feeling in the process of operating an Internet product and the experience of the information exchange process between the user and the product, including the user's emotions, preferences, feelings, and physical and psychological reactions before, during, and after using the product. In order to strengthen the adhesion and attractiveness of products and services to user groups and truly realize immersive interactive experience, designers need to comprehensively consider the user's behavioral logic and practical needs when designing the operation interface and interactive process and then provide efficient and convenient services for their life and work. Unblocking human-computer interaction channels and accelerating the efficiency of information circulation among user groups, products, and services is the essence of the "interactive experience" activity. It attaches importance to the extensive needs of user groups and truly integrates them into the design and production process of product services. It can enhance the practicability

of products and services and strengthen the sense of belonging of the user group. Therefore, human needs have become the core of the "interactive experience." "Interactive experience" has become the focus of attention in the design process of various Internet products and is widely used in multimedia, products, graphic design, computer software, and other fields.

This article uses context awareness to investigate the art design technique of a mobile system's user interaction experience, therefore altering conventional art dissemination and appreciation methods and improving the efficiency of art dissemination.

2. Related Work

Literature [4] integrates art marketing and online e-commerce through a large number of case studies and sorts out the composition mechanism of online art marketing. Literature [5] mentioned that consumers' aesthetic needs are constantly increasing, and the consumer group of artworks is not growing day by day, and online art trading platforms have developed in a unique form. The art market can no longer be limited to traditional auction and art exhibition marketing methods. With the development of Internet technology, the marketing model of art is constantly being updated. Literature [6] pointed out the four current mainstream online art transaction modes: online galleries, online auctions, online information platforms, and online shopping malls. And through the case analysis of some largescale websites, it is concluded that the comprehensive application of these four models in different categories has different market effects. Literature [7] uses a comparative analysis method to get the advantages and disadvantages of the two based on typical cases of art e-commerce and take the peculiarities of traditional culture as the starting point to study the development direction of the art market from ancient times to the present. Literature [8] proposed the use of consumer big data analysis methods to carry out precise market positioning and formulate diversified marketing strategies. Literature [9], based on combining the pricing system and researching the current market demand, proposes strategies for optimizing the marketing of online paintings and calligraphy works: First is to establish a realtime online art value evaluation system; second is to establish necessary relevant laws and regulations and related regulatory agencies; and third is to focus on the humanistic management of the online painting and calligraphy market.

The concept of usability and its essential characteristics are discussed in literature [10], as well as the basic factors that make a product useable: cognizability, memorability, information transmission efficiency, fault tolerance and fault avoidance, and the degree of user satisfaction resulting from the above conditions. The importance of these indicators varies by target user, providing guiding enlightenment for the research of interactive experience of Internet products. Literature [11] informs about the Internet product design process; at the strategic level, develop the optimal interactive process by analysing target user preferences. Real-time user input is gathered throughout the usability assessment

process to constantly enhance the interactive experience. According to literature [12], streamlining page content, simplifying the interaction procedure, minimising new users' learning time, and improving the interaction experience are all important considerations. "Rational deletion, hierarchical arrangement, timely concealment, and smart transfer" are four usability solutions advocated. Literature [13] understands the user's psychology from the perspective of emotional design, and establishes a dialogue mechanism with users based on the contradictory points in daily life to improve the ease of understanding and ease of use. Digital interactive museums have become the research direction of all museums. The use of the Internet to display and digitally store on computers, mobile phones, and other terminals has developed rapidly. More and more museums will continuously update digital interactive functions as the focus of media promotion. The traditional basic information display can no longer satisfy people's curiosity for cultural relics. Users can use mobile devices to "preview" relevant information about the collections in the museum in advance, even more information than the physical exhibition. The description method has also shifted from introductory language to multisensory artistic conception creation, allowing people to produce a sense of presence in the artistic conception, touch the spiritual connotation of cultural relics, and leave a deep impression. However, there is no special research on the combination of online interactive technology and online painting art marketing [14].

3. Context Awareness Model Construction

Context awareness needs to be processed through the spatial measurement model. The discussion on measurement results in measurement science is the most subtle. The core idea of measurement is actually the stability of the order relationship. In fact, for each measurement, the result obtained cannot be the same. Therefore, in modern measurement science, the measurement result is regarded as a "variable." The different values of this variable are collectively referred to as data. Under this framework, measurement errors are inevitable. In fact, measurement is based on errors. We first give the formal concept of error [15]:

$$\delta = x - \mu. \tag{1}$$

In the above formula, μ is the true value, x is the measured value, and δ is the error. The error is absolute error, but the index of absolute error cannot reflect the accuracy of the measurement. For example, when measuring 1 kilometer with an error of 1 cm and measuring 1 meter with an error of 1 cm, although the absolute error is 1 cm, the accuracy of these two measurements is obviously different, so we introduce the concept of relative error [16]:

$$r = \frac{\delta}{\mu}.$$
 (2)

In the above formula, *r* is the relative error, which is the absolute error compared to the true value, usually expressed

as a percentage. If the accuracy of a measurement is considered, this index is usually used.

The true value in the above formula is actually only a theoretical value, which is impossible to obtain by measurement. If the true value is known, then there is no need to measure. Therefore, the measurement process is actually a process of approximating the true value through the measurement value.

First, we give the most basic concept of sampling and then deduce the theoretical basis of sampling on this basis.

Definition 1 (population). In a survey process, the collection of all measurement objects participating in the survey is called the survey population.

Definition 2 (individual). The measurement object that constitutes the population is generally called an individual.

Population and individual are the most basic pair of concepts in sampling. Therefore, their definitions are common and mutually contained. For each individual in the population, we are accustomed to call it a population unit, and the number of individuals included in the population is called the population size.

In truth, population sampling is not always done, and certain population units will never be chosen. Individuals who are likely to be sampled are referred to as sampling units. The sample units are usually listed in a catalog-like format, with each catalogue item corresponding to the actual population. Furthermore, a sample unit represents one or more individuals in the actual population, and a sampling frame is the collection of these sampling units. A somewhat strict definition is given below [17].

Definition 3 (sampling unit). It refers to a certain correspondence between the sampling unit and each individual of the actual population, and each sampling unit can determine one or some population units.

Definition 4 (the sampling frame). It is the mapping population that satisfies the aforementioned mapping requirements.

Similarly, the sample unit and the sampling frame are two fundamental notions, and the sampling frame size refers to the number of sampling units included in the sampling frame. We may specify sampling and samples once the sampling frame has been defined.

Definition 5 (sampling). Sampling refers to the activity of extracting a part of individual from the sampling frame.

Definition 6 (sample). The sample refers to a collection of individuals extracted by sampling.

For each individual in the sample, we call it the sample unit or sample point, and the number of sample points in the sample is called the sample size. The ratio of the sample size n to the sampling frame size N is defined as the sampling ratio, as shown in the following formula [18]:

$$f = \frac{n}{N}.$$
 (3)

The purpose of sampling is to use certain values of the sample to estimate the characteristics of the population to be measured. We give the definition of the population characteristics and estimators as follows.

Definition 7 (population feature). The population feature refers to a certain aggregate attribute of all individual populations.

Definition 8 (estimator). The estimator is an estimate of the corresponding population feature calculated according to the individual in the sample.

Similarly, this is a set of relative concepts. For the same aggregation attribute, the population feature is obtained by calculating all the individuals in the population one by one. However, the estimator is calculated one by one on the individual in the extracted sample, and then the estimator is used to estimate the population feature.

The most common population feature is the population average [19]:

$$\overline{Y} = \frac{1}{N} \sum Y_i.$$
 (4)

Among them, N represents the size of the population, and Y_i represents the value of the *i*th individual in the population.

Correspondingly, we have the corresponding sample average as the estimator of the population average:

$$\overline{y} = \frac{1}{n} \sum y_i.$$
 (5)

In the above formula, *n* represents the sample size, and y_i represents the value of the *i*th individual in the sample.

Since it is necessary to examine the representativeness of the estimator to the population characteristics, the distribution of the estimator is particularly important. In the following, we give the definition of the sampling distribution.

Definition 9 (sampling distribution). Sampling distribution means that for a certain population, under a given sample design and sample size, the sequence of all possible values of the estimator and the probability of these values is the sampling distribution of the estimator.

Now, we continue to examine the more general situation. If the population feature to be estimated is θ and the estimator used to estimate the population feature in the sample is θ , the estimator θ is a random variable. If the probability of a certain possible value θ_c of this variable is assumed to be P_c , since θ is used to estimate the population feature θ , the expectation of θ represents a trend characteristic, and the expectation of examining θ is [20]

$$E(\theta) = \sum_{c} P_{c} \theta_{c}.$$
 (6)

This value may or may not be equal to the population feature. The sampling deviation is defined as the

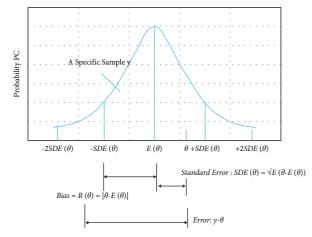


FIGURE 1: Schematic diagram of sampling distribution.

difference between the expected value and the population average:

$$B(\theta) = |E(\theta) - \theta|.$$
(7)

If the sampling deviation is equal to zero, that is, when $E(\theta) = \theta$, the estimate is unbiased.

In sampling, unbiasedness is a crucial term. It is for the estimator distribution of the whole sample, not for a single sample. The sampling procedure and the estimating process are both connected to whether the sampling is impartial. Not all samples are unbiased, and many estimators are biased as well. Based on this paper, the sampling strategy is a biased estimate.

The standard deviation of the sampling distribution is called the standard error. First, we set the variance of the sampling distribution [21]:

$$\operatorname{Var}(\theta) = \sum_{c} P_{c} \left[\theta_{c} - E(\theta) \right]^{2}.$$
(8)

The standard error is the square root of the variance:

$$SDE(\theta) = \sqrt{Var(\theta)}.$$
 (9)

The sampling distribution represents a random fluctuation of the possible value θ_c of the sample. According to the central limit theorem, when a medium-sized sample is taken from a reasonably large population, the distribution will be normal, and the estimator's expectation and standard error will truly represent the normal distribution.

On this basis, we introduce the concept of mean square error, the error is the difference between the two. However, since the realization of the overall eigenvalue is unknown, it can only be used to average the errors of all possible samples. At the same time, because the estimator deviates from the population feature in different directions, the square quantity is used.

$$MSE(\theta) = E(\theta - \theta)^{2}.$$
 (10)

Formula (10) can perform the following transformations:

$$MSE(\theta) = E[\theta - E(\theta) + E(\theta) - \theta]^{2}.$$
 (11)

By expanding the above formula, we get

$$MSE(\theta) = E[\theta - E(\theta)]^{2} + [E(\theta) - \theta]^{2} + 2E[\theta - E(\theta)][E(\theta) - \theta].$$
(12)

Because of $E[\theta - E(\theta)] = 0$, then formula (11) can be obtained:

$$MSE(\theta) = E[\theta - E(\theta)]^{2} + [E(\theta) - \theta]^{2}.$$
 (13)

Formula (13) consists of two parts: the first term is the variance $Var(\theta)$ of θ , and the second term is the square $B^2(\theta)$ of the bias. If the bias is zero, the estimate is unbiased; otherwise, it is biased. If the estimator is unbiased, then if the population is fully sampled, there will be no error. Moreover, all errors are caused by sampling, so they are called sampling errors. The sampling error is the first term in the above formula [22]:

$$SE(\theta) = E[\theta - E(\theta)]^2.$$
(14)

On the other hand, if the estimator is biased, then there will be bias. If the bias cannot be reduced as the sampling size increases, even if all sampling is implemented, there will be errors in the estimate. At this time, the error is called nonsampling error, which corresponds to the second term of the above formula:

$$NSE(\theta) = [E(\theta) - \theta]^2.$$
(15)

Figure 1 shows a schematic diagram of the sampling distribution. Among them, the abscissa represents the possible value of the sampled value, the ordinate represents the probability of these values, and the point under the curve represents a specific sample value. Regardless of whether the original population satisfies a normal distribution, the estimator will show normality at a medium scale. If the true value is θ , the difference between the mean value of the estimator and the true value is the bias. If the bias cannot be reduced as the scale becomes larger, the bias falls into the category of nonsampling error discussion. The y in the figure represents a specific sample value, and the difference between it and the true value is the error of the sample point. The difference between the same average value is caused by sampling, and the average value of the square of these gaps is the standard deviation of the sampling distribution. This indicator can represent the sampling error.

The problem to be solved in this paper is based on aggregation technology. In order to clarify the basic concept of approximate aggregation in wireless sensor networks, we give some basic definitions without loss of generality [23].

We are given a monitoring area *W* in the wireless sensor network, which has *N* sensor nodes. For the convenience of discussion, we take *W* as a flat rectangular area. Then, the space to be measured is a two-dimensional continuous space *D* defined on R^2 , and we use s = (x, y) to denote each point in *D*. We use z(s) to represent the attribute value of a certain point in *D*; then, $Z(D) = \{z(s)|s \in D\}$ represents the attribute of the entire space to be measured. The aggregation operation Agg(*D*) = {Avg(*D*), Max(*D*), Min(*D*)} on Z(D)is our actual solution goal.

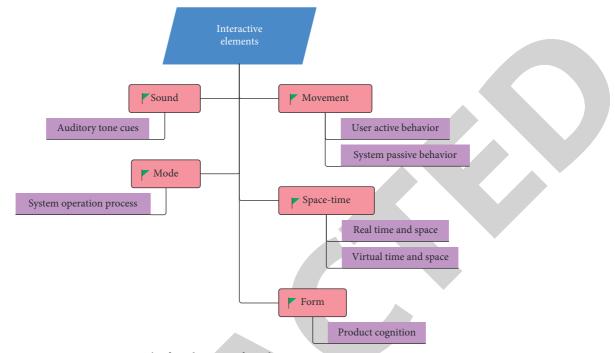


FIGURE 2: The five elements of art design system interaction.

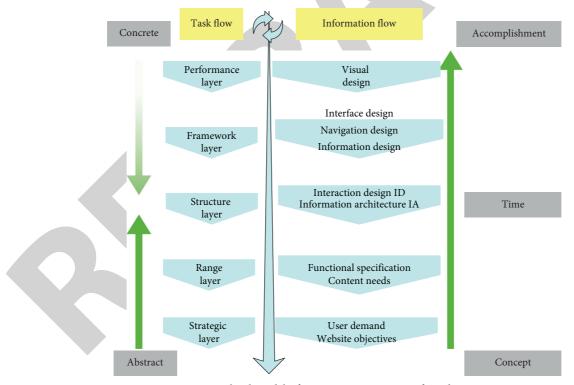


FIGURE 3: Five-level model of interactive experience of art design system.

The *N* sensor nodes deployed in the *W* area are represented by a set $WS = \{ws_1, \ldots, ws_N\}$, where the set of positions corresponding to each node is $LWS = \{t_1, \ldots, t_N\}$. Similarly, the reading of each sensor is defined as v(ws), the set of readings of all sensors is $V(WS) = \{v(ws)|ws \in WS\}$, and the aggregation operation Agg (*WS*) on V(WS) includes

Sum (WS), Avg (WS), Max (WS), Min (WS), and Count (WS).

The so-called wireless sensor network sampling is to select some nodes from all nodes in the entire network to form a sample b to estimate the value to be measured. The set of sample points Sample (WS) is the sample, and the

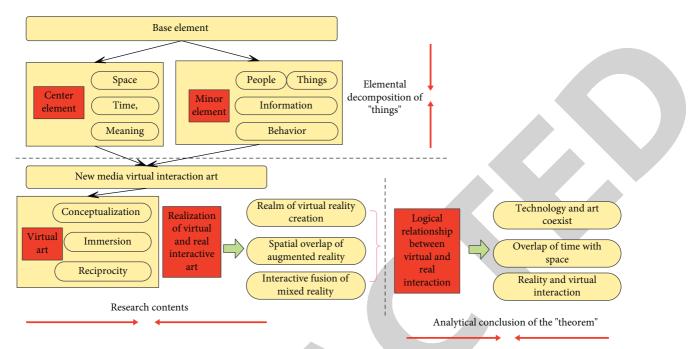


FIGURE 4: Framework diagram of interactive logic research.

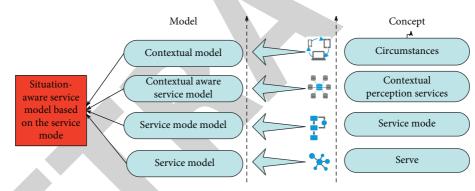


FIGURE 5: Context-awareness service model.

number |Sample(WS)| = M of sample points is the sample capacity.

The total population value, the population mean, and the population percentage are all examples of population features in this article. The rationale for this is because the total value has no relevance in a continuous space, and the total value and ratio may be united using the population average framework.

Therefore, the theoretical derivation part of this paper takes the population mean value as the object for derivation. At this time, we have three means. The first is the true mean to be tested, which is based on the infinite population and is called the target mean:

$$\overline{Z(D)} = \frac{1}{\operatorname{Area}(D)} \int_{D} Z(s) \mathrm{d}s.$$
(16)

The second mean value is the mean value after averaging the readings of all sensor nodes in the plane, which is called the mean value of the sensor network:

$$Z(D) = \frac{1}{N} \sum_{i=1}^{N} V(ws_i).$$
 (17)

The third mean is the mean of the samples after sampling the sensor nodes, which is called the sample mean:

$$Z(D) = \frac{1}{M} \sum_{i=1}^{M} v(ws_i), ws_i \in \text{Sample}(WS).$$
(18)

It is worth noting that these three mean values are all for the same space area. There are many sampling strategies, the calculation methods are also different, and the final form of Z(D) is also different. This paper proposes that the sampling process in the wireless sensor network actually uses the sample mean to estimate the target mean. However, in traditional wireless sensor network sampling, the estimated overall property is usually the sensor network average, not the target average.

In a ubiquitous computing environment, context is defined as any information that characterises an entity.

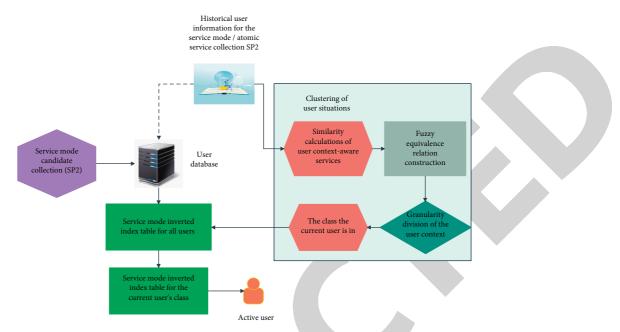


FIGURE 6: Flowchart of service mode selection based on user context clustering.

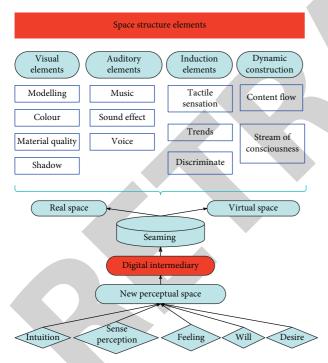


FIGURE 7: Spatial structure analysis.

Although the term is not formal enough, it may adequately describe the situation's meaning. It is precisely because of the rich connotation that the research content on context awareness is also different. Some focus on describing the situation formally; others focus on effectively modeling the situation. In addition, there are others that focus on how to make inferences. Finally, there are some technologies for understanding context awareness from a system perspective, such as providing runtime support for context awareness.

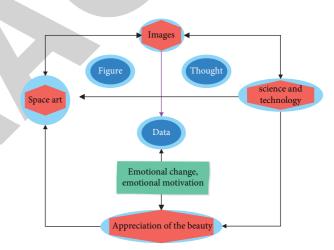


FIGURE 8: Schematic diagram of the mutual transformation of space art and science and technology.

4. Artistic Design Method for User Interaction Experience of Mobile System Based on Context Awareness

The art design system's "interactive experience" contains five components: "action," "time and place," "form," "method," and "sound." "Actions" include not just the user's actively created operational behaviours, but also the system's passive behaviours. The time and space utilised in reality and virtual human-computer interaction is referred to as "time and space." In the subjective awareness of users, "form" refers to the user's perspective of the art e-commerce site. "Method" refers to the logical method of the operating system during the interaction. "Sound" means sound, which plays a prompting role in the interaction process and helps skilled users to develop a fixed interaction habit. As shown in

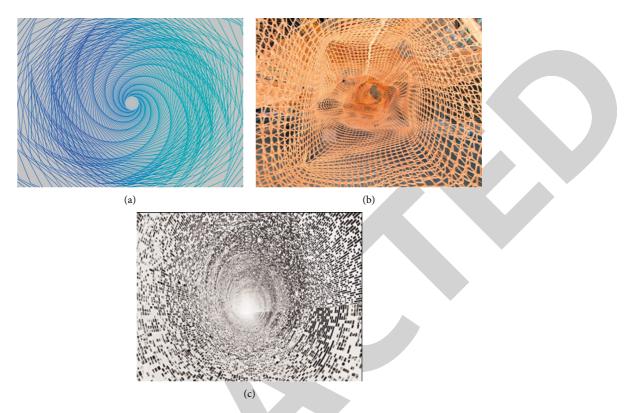


FIGURE 9: The effect of display of the art design system of user interaction experience of mobile system based on context awareness. (a) Interactive immersive art design display 1. (b) Interactive immersive art design display 2. (c) Interactive immersive art design display 3.

TABLE 1: Evaluation of art context awareness.								
Number	Situational awareness	Number	Situational awareness	Number	Situational awareness			
1	86.71	21	87.12	41	91.76			
2	82.95	22	91.46	42	81.48			
3	88.08	23	87.53	43	90.00			
4	82.84	24	88.17	44	86.35			
5	91.21	25	81.24	45	80.82			
6	82.12	26	80.96	46	84.72			
7	87.64	27	84.83	47	83.95			
8	91.29	28	80.39	48	90.99			
9	91.57	29	86.38	49	83.77			
10	90.57	30	79.28	50	78.04			
11	81.80	31	90.04	51	90.25			
12	81.68	32	79.65	52	79.25			
13	90.06	33	80.49	53	89.84			
14	81.94	34	87.64	54	89.92			
15	86.43	35	89.10	55	81.42			
16	85.48	36	79.94	56	91.89			
17	82.50	37	81.09	57	79.66			
18	90.94	38	85.35	58	91.73			
19	88.10	39	90.30	59	81.48			
20	78.36	40	90.04	60	79.81			

Figure 2, the five elements of interactive experience play a guiding role in the design of interactive functions.

The "strategic layer" is the lowest and most basic structure, which mainly discusses user needs, interaction goals, and platform positioning. The "scope layer" collects and analyzes the content requirements of the interactive platform and combines the interactive functions to form the platform's positioning. The "structure layer" is divided into interaction design and information architecture. Through the information architecture of the platform, interaction functions are determined, interaction procedures are determined, and optimal solutions for multiple operations are explored. The "foundation layer" contains the content organisation in the interface, as well as the material that the

TABLE 2:	Evaluation	of	artistic	interactive	experience.

Number	Interactive experience	Number	Interactive experience	Number	Interactive experience
1	92.42	21	85.32	41	92.33
2	87.93	22	91.63	42	83.55
3	89.09	23	86.90	43	89.07
4	87.59	24	89.24	44	84.76
5	89.59	25	93.15	45	88.82
6	87.85	26	85.78	46	92.33
7	93.11	27	92.94	47	93.51
8	90.03	28	93.04	48	87.10
9	91.05	29	92.12	49	87.80
10	93.82	30	84.64	50	87.76
11	87.11	31	84.62	51	84.23
12	91.71	32	85.04	52	86.04
13	93.72	33	85.25	53	94.00
14	93.92	34	86.19	54	84.42
15	87.63	35	82.38	55	89.47
16	87.86	36	85.90	56	90.29
17	85.20	37	83.31	57	91.53
18	84.95	38	91.94	58	92.50
19	82.86	39	83.31	59	86.17
20	85.90	40	92.91	60	86.60

copy section primarily transmits to the user. The "presentation layer" serves as the frosting on the interactive experience, displaying visual effects in the interactive interface to draw users' attention. The five-level model of interactive experience of the art design system is shown in Figure 3.

Figure 4 shows the framework structure diagram of the research ideas and conclusions of the art design system based on user interaction experience. The main elements of affair in this paper are "time," "space," and "meaning." "Meaning" refers to the result of the interaction between reality and the virtual, which expands the exploration of the logical relationship of the interaction between reality and reality.

This paper proposes a context awareness service model based on the service model. The content framework is shown in Figure 5.

In a hypothetical scenario in which the user "perceives" less contextual information, fewer service models are filtered out based on context awareness and evolved service models, but the number of candidate service models remains large. This paper takes advantage of the similarity of service modes selected by users with similar contexts to propose a service mode selection algorithm based on user context information clustering. The general process is shown in Figure 6.

Technology is a means of art, and technology itself is art. This article analyzes the product interactive display technology system based on stereo imaging from a technical point of view and analyzes its spatial structure from an artistic point of view, as shown in Figure 7.

People may develop and construct visible physical space art according to their particular ideals, as numerous items have become symbols of space art in the course of people's desire of comfort. At this time, space art is both a sensory cognition of physical space art and a cognitive examination of the conscious idea of space. People's perceptions of space art are also quite different than in the past. It has changed from passive aesthetics to active experience aesthetics, which makes the aesthetics of space art tend to be the intuitive experience of science and technology, as shown in Figure 8.

Figure 9 depicts the impact of the art design system on the user interaction experience of a mobile system produced using the simulation platform. Figure 9 shows how the system proposed in this work may provide users with a scientific and effective aesthetic immersion, as well as increase the user's interactive experience and user experience with the use of context awareness technology. On this foundation, numerous sets of tests are used to assess context awareness and interactive experience, yielding the test results presented in Tables 1 and 2.

From the above research, we can see that the art system of user interaction experience of mobile system based on context awareness proposed in this paper has a good context awareness effect and user interaction experience. Moreover, it can effectively enhance the user experience and has a positive effect on the promotion of art development and art dissemination.

5. Conclusion

The common understanding of art system of context awareness, or context awareness, is to collect information about the user's situation using computers, mobile phones, and other wearable devices and to make more accurate predictions of the user's behaviour and activities based on the collected contextual information, in order to better meet the user's personalised artistic needs. The context-awareness art recommendation system may actively or passively record context information about the current user's position, integrate it into the user's personal preference model for analysis and computation, and then propose content or products that fit the user's present circumstance. As generating recommendations to fulfil the various creative demands of users in a certain situation, it may make full use of user context information when compared to typical recommendation systems. Contextual information is critical for improving the recommendation system's accuracy and user happiness. However, how to integrate contextual information into the recommendation process reasonably and fully is the focus and difficulty of context awareness recommendation research. The research results show that the art system of user interaction experience of mobile system based on context awareness proposed in this paper has a good context awareness effect and user interaction experience.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding the publication of this paper.

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