Retraction

Retraction: Research on Demand Preference Analysis System of Contemporary Art Market Based on Big Data (J. Phys.: Conf. Ser. 1744 042133)

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The authors of the article have been given opportunity to present evidence that they were the original and genuine creators of the work, however at the time of publication of this notice, IOP Publishing has not received any response. IOP Publishing has analysed the article and agrees there are enough indicators to cause serious doubts over the legitimacy of the work and agree this article should be retracted. The authors are encouraged to contact IOP Publishing Limited if they have any comments on this retraction.

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Research on Demand Preference Analysis System of Contemporary Art Market Based on Big Data

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Abstract: In less than 30 years, the Chinese art market has completed a gorgeous transformation from traditional to modern. In the process of development, great changes have taken place in the form of China's art market. The scale of art transaction is gradually expanding, and the price of Chinese art market is also getting higher and higher. In order to better achieve efficient retrieval under the background of big data and know the demand of contemporary art market, this paper studies a kind of art demand preference analysis system based on big data. Based on the big data environment, using machine learning method, more accurate detection of the general public's interest in art. By extracting user preferences from the big data of users' search records, a search model with synchronous changes with user preferences is established by using machine learning method, so as to predict users' interest preference for artworks in advance. The system is applied to Baidu, Jingdong and other platforms, and a questionnaire survey is carried out. The results show that the detected data are similar to the survey results.

Keywords: Big Data, Machine Learning, Work of Art, Preference Analysis

1. Introduction

Due to the influence of the economic and political environment in the early stage of the development of China's art market [1-2], the development of the art market has been in a constant state for a long time. With the implementation of the reform and opening up policy in all corners of the country, the domestic art market has also developed rapidly, and the corresponding potential problems have gradually emerged. Since the reform and opening up, under the influence of the new economic system [3-4], the Chinese traditional art market has undergone essential changes. Great changes have taken place from the form of operation to the operation itself. In the past, traditional antique markets and shops have been replaced by modern forms of exchanges, such as galleries, auction houses and art fairs. With the rapid development of modern art [5], the demand for art is more and more urgent. Therefore, understanding the public's preference analysis of art can help us understand the trend of consumers' interest in modern art, and give in to their preferences.
Big data [6-8] is the product of the Internet. Big data has given birth to the innovation of enterprise business model and a large number of emerging industries. Many enterprises make use of big data to constantly push out the old and bring forth new ones, and constantly introduce new business and service modes. For example, Baidu, Google and other Internet enterprises use big data to constantly launch new service products. E-commerce companies such as Taobao and Jingdong use big data to locate consumer preferences. The value of big data is also reflected in promoting the upgrading and transformation of traditional industries. Traditional automobile, finance, telecommunication and other industries also benefit from big data. Advanced big data mining technology promotes the promotion of data-based decision-making and operation, making enterprise decision-making more in line with the development of science and technology, more detailed production process, more personalized service and more predictable operation. It has a great contribution to strengthen the product quality and production speed of traditional industries.

Therefore, the art demand preference analysis system proposed in this paper can detect the desire of consumers in major cities to eat various artworks. With the support of big data background, the machine learning method [9-10] is used to monitor the search volume of different artworks by users, and then statistical analysis is conducted on the preferences of users in various provinces and cities for artworks. Search in a large number of search keywords to form a memory, will set good retrieval requirements, real-time monitoring of user search, establish an adaptive search model with user synchronous changes, and predict the demand of residents for art in this area. In addition, the experimental link is set up to test the established system, and the results show that the system has a strong application value.

2. Implementation of Art Preference Analysis System Based on Machine Learning Technology under the Background of Big Data

2.1 Technical Framework of Art Preference Analysis under the Background of Big Data

In this paper, for big data resources of Jingdong, Taobao, Baidu and other platforms, we use machine learning technology to supervise the user’s preference model in the search process, and then record the search record for the overall prediction of the subsequent preference analysis system.

![Figure 1. User search preference analysis process](image)

2.2 Implementation of Art Preference Analysis System based on Machine Learning Technology

The first is the user search behavior. A series of activities from inputting feature words to recording are monitored by machine learning. The user search record is shown in Table 1. We can get the sample data of user search purpose.

| Sample number | User ID | Search keywords |
|---------------|---------|-----------------|

Table 1. Sample display of user search purpose
Feature words extraction is the classification of machine learning of user preference search model. According to the keywords input by users, the feature words are classified according to the formula (1), (2) and (3). The set of classification is 

\[ R : R = [x_1, x_2, x_3] \]

\[ x_1 = \{ \text{The number of keywords matching with the art productname} \} \]

\[ x_2 = \{ \text{The number of words that match the keywords with the features of the artwork} \} \]

\[ x_3 = \{ \text{The number of words that match the color of the art} \} \]

The results of each classification are expressed by formula (4), where \( y \) represents the feature word classification and \( \theta \) represents the control parameters of the classification model. According to the predicted results, the user's preference can be expressed completely. It mainly extracts feature words from continuous user search keywords, supervises machine learning user preference search model, carries out real-time online monitoring and updates the demand for artworks in different regions, and finally presents the generated report.

\[ p = (y = 1|R; \theta) \]

In this paper, machine learning technology is used to set the parameter control \( \theta \) of the prediction model in equation (4) to output the user's demand preference analysis of contemporary art market with high probability.

### 3. Experimental Background and Parameter Setting

Under the huge data system, it is difficult to calculate the local demand preference for contemporary art through manpower statistics. Therefore, machine learning technology based on big data background is used for real-time monitoring, recording and calculating people's preference for artworks in different regions. Compared with the early times, the capital and art flow function of the investment era is stronger, which is more conducive to the preservation of fine works and the exploration of young artists. At the same time, the intervention of art finance has brought more new transaction modes and brought great changes to the art market. We must pay attention to this change. And keep up with the trend of the times, know the general public's preference for art, and know that the current market environment can help us grasp the development status of art. The parameter settings used in this paper are shown as Table 2.

| Parameter setting | Numerical value |
|-------------------|-----------------|
| Statistical tools | MATLAB          |
| \( \theta \)      | \( \theta_k = \theta_k - \alpha \frac{1}{n} \sum_{i=1}^{n} (h_\theta(R^i) - y^i) y'^i, (k = 0, 1, 2, 3) \) |

### 4. Discussion

#### 4.1 System Feasibility Test

We will set up in advance of the questionnaire to the local, a total of 500 copies, 438 valid questionnaires. The system is also applied to Baidu, Google and other browsers, as well as Taobao,
Jingdong and other e-commerce platforms. It extracts feature words to predict the local people's demand preference for artworks.

![Graph showing error analysis of prediction model for time varying detection system](image)

**Figure 2.** Error analysis of prediction model for time varying detection system

Shown as Figure 2, we analyzed the error of the questionnaire survey results with the system at the same time, and found that the influence of the questionnaire survey results on the error value is relatively small, and it is difficult to present the results of the questionnaire survey perfectly. Among them, there are many uncertain factors, resulting in the degree of consumer demand for art to follow the public. Therefore, using the system model proposed in this paper, the error rate is greatly reduced, and the demand orientation of the public for art works in different time periods can be updated in real time. It only takes half a month to reduce the error to the minimum, and the error value fluctuates little in other time periods, which shows that the feasibility of the system is strong.

4.2 Expert Satisfaction Survey
Figure 3. Distribution of expert satisfaction

Shown as Figure 3, we visited local art appreciation experts and system development professionals and scored the preference analysis system proposed in this paper. Art appreciation experts believe that this is a novel idea, which can predict the development of artworks in a certain region, and take the next step based on the predicted results, so as to effectively avoid detours and form a huge collection of art industry. With the rapid development of the domestic art industry and the prosperity and stability of the art market, people gradually begin to understand, pay attention to and consume art. Some domestic TV stations have also launched a series of TV programs to popularize art professional knowledge to the national audience. Therefore, 85% of the experts agree with the preference analysis system proposed in this paper and give some professional suggestions to ensure that the system can be implemented.

4.3 Background Significance of Contemporary Art Market Demand

With the development of science and technology and the rapid development of economy, people's requirements for life have gone beyond the material level. Now, in the face of a wide range of goods, more and more people began to be silent. This attitude is not due to poor product quality or unsightly style, but to the fact that people's demand for material level has reached the state of "overload" while bringing all kinds of "surprises" in modern society. In this environment, people gradually began to pursue the spiritual level of desire and freshness. Under the influence of the global economy, the world art market presents a thriving scene. At the same time, the development of art industry and the prosperity of art market also promote the pace of global economy.

Foreign art market started earlier, because of the strict law, the market and consumers formed a fixed consumption system, so the art market gradually showed saturation. Therefore, enterprises should strengthen their own propaganda means, look for suitable investors everywhere, and maximize their own interests. In recent years, the development of China's art industry and its market have great potential in terms of speed and scale, which has attracted the attention of the people of the whole country. Especially in recent years, the overall quality of Chinese people has been improved. Many consumers have been able to identify the quality of artworks. China's art market is also further expanding, forming a large-scale art industry cluster.

This paper analyzes the contemporary art market by applying the established system to various provinces and cities. From the whole to the part, from the part to the whole method, from the
development of the global art market, further into the domestic contemporary art market. Finally, according to the current situation of Beijing contemporary art industry and market development, the gap between domestic art market and global market is correctly understood. The regulation and operation of the domestic art industry and its market on the market have played a positive role in ensuring that the domestic art industry can better serve more art consumers.

### 4.4 Suggestions for the Development of Contemporary Art Industry

Most of the art industry gathering areas in China are composed of artists spontaneously. Artists are the main body of art field. Although most of them have received good professional education, what they lack is a stronger sense of teamwork in the whole art district. In recent years, the development of domestic art industry and market requires artists not only to improve their own professional quality, but also to improve their own professional quality and team consciousness.

1. The development of art industry is different from other domestic industries. Domestic investment in the art industry will help accelerate the transformation and upgrading of the manufacturing industry, which is a good thing for the country and the people.

2. The development of art industry has led to the development of domestic related industries and increased the employment rate of social personnel, which is the inevitable requirement of domestic economic transformation and upgrading. At the same time, improving the quality of service industry is the modern trend of domestic economic development. The guarantee of service quality is conducive to the development of domestic art industry and provides an important guarantee for the development of domestic art industry and its market.

3. According to its own special advantages, the development of contemporary art industry is conducive to the personalized development of tourism in various regions. Reasonable use of the art industry in recent years, the development of art reproduction, art licensing and other art derivatives relatively low advantages attract tourists from all over the world, at the same time better combine art and life, make life more artistic.

### 4.5 Suggestions for the Development of Contemporary Art Market

1. Apart from artists and tourists, the largest proportion of people in the art district is the service group. In order to develop the art industry with high quality, the service quality of service personnel in the art field is needed to ensure the faster and better development of the art industry chain.

2. Under the influence of domestic macroeconomic policies, the government's support will promote the development of domestic contemporary art industry to a more standardized direction.

3. The current economic situation requires the domestic art industry to gradually develop to the international art industry with the standard of marketization and internationalization, so as to strengthen the domestic contemporary artist team. At the same time, it will create a better platform for the original artistic works of domestic artists and promote the domestic excellent art works to the international stage.

### 5. Conclusion

The development of contemporary art industry is mainly due to the lack of a complete and efficient industrial chain, followed by the weak awareness of artists. In view of the above problems, this paper proposes a demand preference analysis system of contemporary art market based on big data. Machine learning technology is used to monitor the input and classification of user feature words to predict the public's preference for art works. Through the experiment, it is concluded that the system can greatly reduce the error value of predicting citizens' preference for art works, which is more convenient than the form of questionnaire survey, and the local experts also praise the system. The development of domestic art industry and its market is speeding up and its scale is expanding day by day. Therefore, it is very important to understand the market demand for artworks. The system can effectively predict the demand preference of citizens in different regions for art market and make reasonable planning in
advance.

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