An Evaluation of the Educational Thought of Ecological Aesthetics in Traditional Humanities and Arts

Yong Zhang[1,a], Meiliang Yang[2,b*], Dong Ye[1,c], Pingping Luo[1,d]

[1]Jiaying University, Meizhou, 514015, Guangdong, China
[2]No. 2 Experimental Kindergarten Dabu, Dabu, 514200, Guangdong, China
[a]yongzhang4935@jyu.edu.cn, [b]dbyml@126.com, [c]345427617@qq.com, [d]sallyping2008@163.com
*Corresponding author

Abstract: Eco-aesthetics is a philosophy that combines ecology and aesthetics to study the relationship between man, nature and society, and is a discipline that includes the concept of sustainable development. In traditional humanities and arts, there are many aesthetic ideas that fit with it. If these ideas can be extracted and used in education and teaching, it would be able to vigorously promote the development of ecological aesthetics and implement the concept of green sustainable development. Therefore, the purpose of this paper is to analyze the ecological aesthetics in the traditional humanities and arts. Through the retrospective analysis of the previous literature, this paper realized that the traditional analysis method has the limitations of being incomplete and in-depth. In order to fully extract the ecological aesthetic ideas in traditional art, this paper proposed a factor analysis method (FA), and analyzed and compared several selected humanities and art works. The results showed that in the selected traditional works of art, the ecological aesthetic ideas mainly include the idea of letting nature and inaction govern, the idea of Feng Shui and the Five Elements and Eight Trigrams, the idea of harmony between man and nature or the idea of maintaining balance between man and nature, the idea of transforming nature to serve human beings. In addition, in order to understand the advantages of the algorithm in this paper, this paper compared the analysis results of the FA algorithm and the traditional algorithm. It was concluded that the average time of FA was about 200ms per article, which was lower than 1/2 of the time of traditional algorithm; the average accuracy of FA was 89.3%, which was 13.7% higher than that of traditional algorithm. This showed that the use of FA in this paper to analyze the ecological aesthetics in traditional humanities and arts has the characteristics of being faster and more accurate.

Keywords: Ecological Aesthetics, Traditional Humanities and Art, Aesthetic Thought, Factor Analysis

1. Introduction

The traditional humanities and arts more reflect the simplicity of nature. People should let nature go and maintain the harmonious beauty of ecology with a self-sufficient way of life, while the emotional tendency to "transform the environment" is to "go with the flow". Contemporary ecological society construction is a more complex social reality. The interpenetration between the human environment and the natural environment is undeniable, and the degree of harmony of the human environment is an important symbol to measure the degree of social harmony. With the development of history, the evolution of the social system has become increasingly complex and diversified. While providing ecological enlightenment for human beings, the traditional concept of ecological ideal country should also be based on contemporary social reality, and achieve self-transcendence in the return, so as to build an ecological society in which the human environment and the natural environment develop harmoniously at a higher level. Ecological aesthetics is a concept of returning to nature, maintaining nature and sustainable development, and the goal of ecological aesthetics is exactly in line with this. Therefore, the analysis of its ecological aesthetic concept from the perspective of traditional humanities and arts has great significance and value for people's aesthetic education. There are many kinds of traditional culture and art forms in China, so its research is a difficult and challenging road.

The innovation of this paper is to propose a big data FA algorithm. The application of this algorithm can more quickly and accurately analyze the ecological aesthetic ideas embodied in traditional humanistic and artistic works. At the same time, this paper also made use of retrospective analysis of

the limitations of previous studies, and conducted research on ecological aesthetics and traditional humanities and arts from various aspects.

2. Related Work

Eco-aesthetics is an aesthetic that combines the concepts of nature and green development. Some scholars have conducted relevant research on the idea of ecological aesthetics. Li J studied the characteristics of ecological aesthetics and applied ecological aesthetics to the space design of rural accommodation, so that villagers could establish a correct ecological view of nature and a suitable leisure lifestyle [1]. Combined with lake view and library, Ye K analyzed its design connotation and public effect from the perspective of ecological aesthetics, which aimed to explore a feasible way for the construction of urban cultural experience space [2]. Fanren Z used ecological aesthetics to expound the concept of simple life, which was connected with the beauty of Chinese construction [3]. Yang A studied the connection between Miao culture and religion from the perspective of ecological aesthetics [4]. Although these studies have promoted the application of ecological aesthetics to a certain extent, in fact, these studies have not yet deeply understood the idea of ecological aesthetics.

In order to have a deeper understanding of the idea of ecological aesthetics, it should be diged deeper from the traditional humanities and arts. For this reason, some scholars study ecological aesthetics through traditional humanities and arts. Kurniasari D A established a culture-based ecotourism village by conducting research on the culture and art of traditional indigenous peoples [5]. Alessandri S showed how humanities and arts can be actively combined with natural sciences and ecological aesthetics to construct effective solutions [6]. Paula B D built a knowledge platform of traditional arts and humanities through digital technology, and built a bridge of ecological aesthetics education [7]. Yan L took the roof tiles and roof drainage technology of traditional buildings in Lingnan as the main research objects, and summed up a roof restoration technology with ecological aesthetics [8]. Although these scholars skillfully express their ecological aesthetics ideas through some traditional humanities and arts, their research has limitations and has not fully explored the ecological aesthetics education ideas in traditional humanities and arts, so it needs to be further improved.

3. Embodiment of Ecological Aesthetics in Traditional Humanities and Arts

3.1 Idea of Ecological Aesthetics

In traditional aesthetics, the ancients advocated cherishing every plant and tree, because traditional philosophy believed that natural life was valued and ancient productivity was low. Human beings have limited use of material resources. In order to meet the needs of daily life, it is necessary to find the maximum utilization value in the limited material materials, and regard the maximum value of materials as the technical demand [9]. In Figure 1, some eco-aesthetic landscapes are shown that both serve human beings and optimize and protect the environment. People cannot say that the material life of the ancients was barren, while the material civilization of China is rich and colorful, because the characteristics of each raw material are brought into full play, which also reflects the aesthetic value of natural materials.
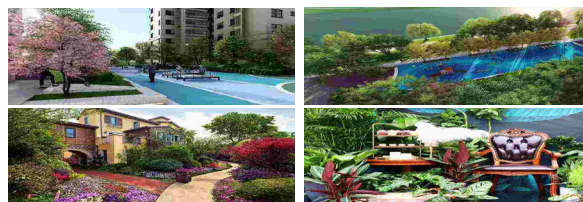

Figure 1: Ecological aesthetic landscape

Bamboo wood, rough stone, natural water, etc. are also common in modern aesthetic design. Therefore, it is necessary to pay attention to the best utilization efficiency of products, especially in the case of a large population and an increasingly tense ecological environment. As long as the utilization efficiency of the product can be properly improved, it can bring great economic benefits [10-11]. The modern "systematic commodity obsolescence system" is a powerful obstacle to the concept of "full utilization". Due to the obsolescence of the form and function of aesthetic products, the life of the product is often advanced, which brings huge losses to the material environment on which human

beings depend. How to improve consumers' use experience without affecting consumers' cognition of "exhaustion" is an issue that must be paid attention to in future ecological aesthetics research. The key to realizing this problem is to enhance consumers' awareness of environmental protection and enhance the aesthetic quality of products. There is a harmonious interaction between the two [12-13].

The development of ecological aesthetics is to meet the needs of modern society, and it is also a development concept that benefits mankind. The development process of ecological aesthetics can be shown in Figure 2. The initial ecological aesthetics can be said from the proposal of ecology in 1866, when ecology paid more attention to the construction of theory. Animal ecology appeared in 1927, followed by animal and plant ecology in 1954. Finally, in 1973, someone put forward a deep ecology based on ecological ontology, which provided the theoretical basis for the current ecological aesthetics.
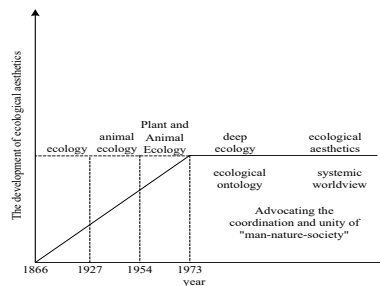

Figure 2: Development of ecological aesthetics

In traditional society, from the perspective of ecological aesthetics, because there is no scientific application and no environmental pollution, there is no conflict between man and nature, and there is no shortage of resources due to a large population. This allows people to live a frugal lifestyle. They have their own comfort methods, simple folk customs, and no external factors. People live in a relatively closed and self-improving world, where social order is orderly and social relations are harmonious. However, human beings have independent thoughts and are selfish. Humans need to transform the environment to serve life, so the original ecological aesthetics must be backward or inadvisable. The best way is to not only destroy the ecological environment, but add the icing on the cake, which can not only serve human beings, but also maintain ecological balance and beautify the environment[14-15].
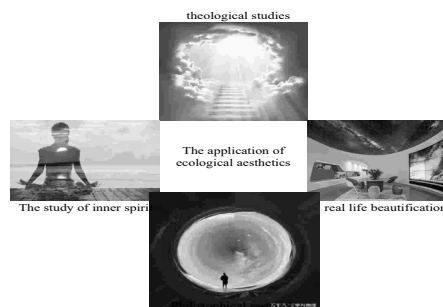

Figure 3: Application of ecological aesthetics

With the development of society and the improvement of people's awareness of ecological environmental protection, people have begun to pay more and more attention to the application of ecological aesthetics. In Figure 3, ecological aesthetics can not only be applied to a variety of theoretical studies, but also to beautify the real environment and drive people's inner spirit. Because the ecological ideal expressed by ecological aesthetics is the harmonious coexistence of man and nature, and the endless existence of all things. There is no artificial decoration and carving, no fighting, no one would hurt, no one's fear, and no one's worry. Human life does not distinguish between noble and inferior, and treats each other equally. The social order is harmonious and the people live and work in peace and contentment. The weather is good for the four seasons, and the land is full of vitality. Although this society is more like a primitive social form, the ecological concept it contains is worthy of recognition [16].

3.2 Traditional Humanities and Arts

In the traditional humanistic aesthetics, there are quite rich means of expression in terms of

modeling life form and dynamic rhythm. From Figure 4, it can be seen that in the traditional humanistic art, there are Taoism, Confucianism and so on. Most of the traditional art presents this experience and feeling in different ways by observing and experiencing the natural life forms and thinking about the origin of the creation of life. The traditional Chinese creative culture has rich forms of life. Life forms are expressed in ways that can be contradictory or calm, sharp or smooth. Excellent aesthetic design works should contain vivid and appropriate life forms, which is not only the expression of aesthetic forms, but also the requirements for aesthetic works of art[17-18].
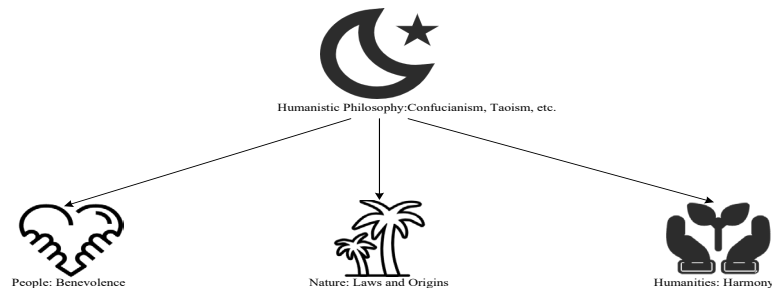

Figure 4: Traditional humanistic thought

Traditional artistic creation and creative culture are based on the expression of human living conditions and social environment to arouse the emotional resonance of audiences and users, thereby enhancing group and social awareness, and at the same time contributing to human ideological communication. In Figure 5, traditional arts such as qin, chess, calligraphy and painting, paper-cutting, opera, etc. all express ideas through the art of beauty. It is a reflection on human life and existence based on social environment and historical characteristics. It can not only enhance the relationship between people, but also enhance people's sense of responsibility, so that people's social attributes to people and the development of people are closely related to the development of the whole society, which has a very positive effect on building a modern human society with advanced civilization [19].

The core content of traditional aesthetic works is regression and reflection. Contemporary aesthetic concepts should show friendliness and respect for nature, and make people return to the aesthetic concept of advocating nature. In Figure 6, in the famous works represented by Tao Te Ching, the ecological aesthetic concept of "Tao follows nature" is neither "following nature" nor "imitation of nature" in Taoist thought. The concept of "Tao follows nature" does not directly copy the form and power of nature, but defines "Tao" as the basic laws and laws of the universe. From the perspective of "Tao", "people follow the earth, and the earth follows the sky; the heaven follows the Tao, and the Tao follows the nature", which respects nature and regards all things as having natural beauty. The traditional natural ecological aesthetics is an extension of the product design concept, so it not only highlights the existence of beauty, but also shows that beauty is a natural realm [20].
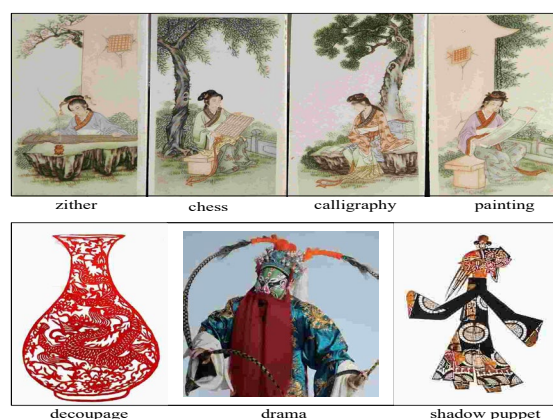

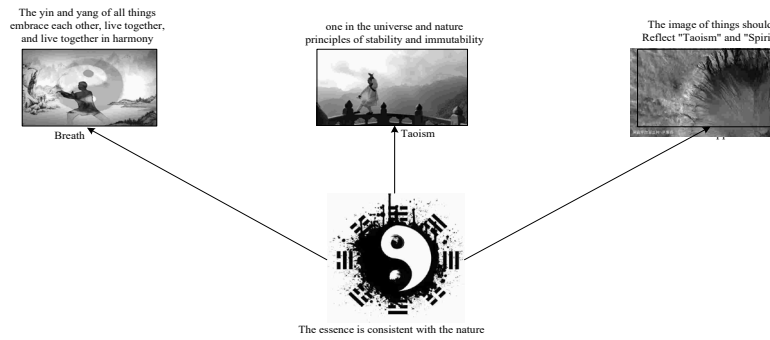
Figure 5: Traditional humanities and arts

Figure 6: Taoist ecological aesthetics

The Taoist "Qi" contains the aesthetic elements of various life forms. The manifestation of "Qi" in the traditional philosophy of creation is the most fundamental category of material existence in ancient Chinese philosophy, and it is also the discussion of "Qi" in ancient oracle bone inscriptions. In the traditional philosophy of creation, the relationship between man and heaven, earth and man is composed of "qi", and "qi" is the mutual induction, communication and influence between man and heaven, earth and man. It is the concept of "all things are of the same origin" that makes people feel a natural intimacy with everything around them. The traditional philosophy of creation believes that "qi" is all the characteristics of human life, including temperament, body, feeling, thinking, etc. [21].

The differences in Confucianism, such as the aesthetic concepts reflected in the traditional Confucianism such as The Analects of Confucius and the Book of Songs, are of great significance to the discussion of modern product design concepts in the category of aesthetics. In Figure 7, it can be seen from the creator's view of human affection that the word "benevolence" means that "benevolence" is an aesthetic concept of "goodness" from two people, or it can be said that one person stretches out his hands. The relationship between people also starts from two people. It can also be said that "benevolence" is the agreement between two people. Therefore, in form, the word "benevolence" means "people" followed by the word "two". The pursuit of "benevolence" is a kind of spirit and the most important aesthetic concept of Confucianism. It freed man from the darkness of millions of years and from the bondage of beasts. It enables people to find harmonious interpersonal relationships, and creates a new society and a new civilization, thus embarking on a new path. It is the wisest choice to move towards a better future. "Benevolence" is not only the affirmation of human existence and meaning, but also the care and friendliness of human society and other life forms. This is the basic criterion for the survival and development of a system. The concept of natural human feelings based on "benevolence" has been widely reflected in traditional ecological aesthetics. This reflects the important aesthetic status of "benevolence" in the traditional philosophy of creation [22].
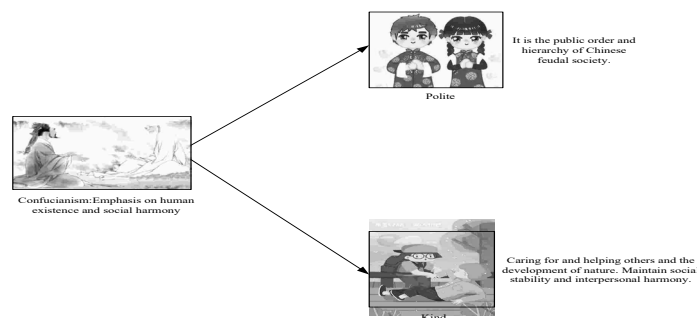

Figure 7: Confucian ecological aesthetics

In addition, it also examines from the two levels of "benevolence" and "propriety" that constitute human society. "Propriety", which reflects the inner level of social stability and interpersonal relationships, originally referred to the public order and class system in Chinese feudal society. Confucius' "propriety" is reflected in the decoration and color of people and things. It plays a certain control and normative function in maintaining social order, and emphasizing social attributes is a feature of the Chinese concept of creation. Many traditional objects have an important humanistic aspect.

3.3 Factor Analysis Method

Factor analysis (FA) is one of the common algorithms for big data. Through FA, common factors can be extracted from many data, and common information in the data can be found. This paper used this method to analyze the traditional humanities and arts to understand the commonalities, and to mine the educational thought of ecological aesthetics.

It is assumed that there are m kinds of traditional humanities and art works, each of which contains i, and then the data modeling is carried out with Gaussian distribution as:

$$\mu = \frac{1}{m}\sum_{i=1}^{m} x^i \tag{1}$$

$$\sum = \frac{1}{m}\sum_{i=1}^{m}(x^i - \mu)(x^i - \mu)^T \tag{2}$$

Among them, μ is the mean; Σ is the variance, and Σ is irreversible, that is:

$$\frac{1}{\sqrt{|\Sigma|}} = \infty \tag{3}$$

The variable X in the works should be related to the common factor F in various works, that is, the function can be expressed as:

$$X_i = a_{i1}F_1 + a_{i2}F_2 + ... + a_{im}F_m + \varepsilon_i \tag{4}$$

$$i = 1,2,..., p \tag{5}$$

Among them, ε is the deviation factor.

Its model is:

$$X = AF + \varepsilon \tag{6}$$

and there are:

$$X = \{X_1, X_2,..., X_p\} \tag{7}$$

$$A = \begin{bmatrix} a_{11} & a_{12} & ... & a_{1m} \\ a_{21} & a_{22} & ... & a_{2m} \\ ... & ... & ... & ... \\ a_{p1} & a_{p2} & ... & a_{pm} \end{bmatrix} \tag{8}$$

$$F = \{F_1, F_2,..., F_m\} \tag{9}$$

$$\varepsilon = \{\varepsilon_1, \varepsilon_2,..., \varepsilon_p\} \tag{10}$$

In addition, F should be uncorrelated with the bias factor, that is:

$$Cov(F, \varepsilon) = 0 \tag{11}$$

The common factors are not correlated, that is:

$$D_F = \begin{bmatrix} 1 & & & 0 \\ & 1 & & \\ & & ... & \\ 0 & & & 1 \end{bmatrix} \tag{12}$$

The bias factors are uncorrelated and have unequal variances, that is:

$$D_\varepsilon = D(\varepsilon) = \begin{bmatrix} \sigma_1^2 & & & 0 \\ & \sigma_2^2 & & \\ & & ... & \\ 0 & & & \sigma_p^2 \end{bmatrix} \tag{13}$$

When the commonality factor F is derived, the covariance is calculated:

$$\sum = U \begin{bmatrix} \lambda_1 & & 0 \\ & ... & \\ 0 & & \lambda_p \end{bmatrix} = \sum_{i=1}^{p} \lambda_i e_i e_i^T \tag{14}$$

Among them, U is the eigenvector matrix, and e is the eigenvalue; λ is the eigenroot.

It can also be computed with a variable function:

$$\sum = Cov(X) = Cov(AF + \varepsilon) = ACov(F)A^T + Cov(\varepsilon) \tag{15}$$

According to Formula (14), there are:

$$a_i = \sqrt{\lambda_i} e_i \tag{16}$$

$$A = (a_1, a_2, ..., a_m) \begin{pmatrix} a_1^T \\ a_2^T \\ ... \\ a_m^T \end{pmatrix} \tag{17}$$

Therefore, the final common factor model can be expressed as:

$$X_p = \sqrt{\lambda_1} e_{p1} F_1 + \sqrt{\lambda_2} e_{p2} F_2 + ... + \sqrt{\lambda_m} e_{pm} F_m + \varepsilon_p \tag{18}$$

According to the comparison between the common factor and the concept of ecological aesthetics, the ecological aesthetics thought contained in the traditional humanities and arts is obtained.

4. Questionnaire Design and Experimental Data

In order to more specifically understand the types and related works of traditional humanities and arts, this paper distributed questionnaires through the online questionnaire star platform. The categories of traditional culture were collected, and the more famous works of art were surveyed. The basic information of the questionnaire is shown in Table 1. A total of 300 questionnaires were distributed, and 240 valid questionnaires were finally recovered.

Table 1: Basic information of the questionnaire

Information	value	proportion
The number of questionnaires issued	300	—
The number of questionnaires returned	268	89.3%
The number of valid questionnaires	240	80%

Table 2: Quantity distribution of selected artworks

Rank	category	Number of works
1	traditional food	57
2	poetry	50
3	architecture	38
4	porcelain	32
5	drama	23

After that, this paper selected 5 kinds of common traditional culture and art and 200 related traditional art works, and used FA method to analyze. Among them, the number of works of art contained in these five traditional cultures and arts is shown in Table 2. Among them, the number of works of traditional food culture selected was the largest, followed by poetry.

5. Survey and Test Results and Discussion

After sorting out the collected questionnaires and then analyzing the results, the final survey results are shown in Table 3. From Table 3, it can be seen that among the 240 questionnaires, there were 15 major categories of traditional culture and 350 subcategories; there were 449 kinds of traditional cultural and artistic works collected, which included 67 kinds of famous works. This showed that there were many types of traditional culture and art in China, and the works of art were also relatively abundant. The research on using FA to analyze ecological aesthetics has a good data foundation.

Table 3: Questionnaire results

Item	Number	Example
Traditional culture category	15	Calligraphy, Martial arts
Traditional culture sub-category	350	Regular script, running script, Taijiquan, Huashan swordsmanship
Traditional cultural and artistic works	449	The Analects,Nuwa mending the sky
Famous works of art	67	Journey to the West,Three Kingdoms

This paper selected 200 artworks from them for FA analysis. According to the common factors, the main ecological aesthetic ideas it contains are shown in Table 4.

Table 4: Eco-aesthetics ideas

Ecological aesthetics	number	representative symbol
Taoism and nature,go with the flow	108	T1
Geomancy,gossip array	72	T2
the unity of man and nature,Man and nature preserve dynamic balance	51	T3
Transforming the natural ecology and serving human beings	48	T4

From Table 4, it can be concluded that the ecological aesthetic ideas embodied in traditional culture and art were the ideas of Taoism, nature, or inaction, which were mentioned 108 times in 200 works of art. The second was the ecological aesthetic idea guided by Feng Shui or Bagua diagram, which was mentioned 72 times. The third was the ecological aesthetics of the harmony between man and nature, and the balance between man and nature, which was mentioned 51 times. Finally, the ecological aesthetics of transforming nature and serving human beings was mentioned 48 times in total. From this point of view, the traditional cultural and artistic works are more to express an ecological aesthetic idea of inaction. The first is to emphasize the protection of the original ecology, and the second is to carry out reasonable transformation on the basis of protecting the original ecology, rather than destroy it.

The number of main ecological aesthetic ideas or common factors contained in each traditional cultural and artistic work is shown in Figure 8.

It can be seen from Figure 8(a) that among these artworks, there were 4 artworks with 10 T1 common factors, and 3 artworks with 8 T2 common factors. It can be seen from Figure 8(b) that 2 artworks had T3 common factor 5 times, and 4 artworks had T4 common factor 5 times. Among these common factors, the 70th artwork had the largest sum of occurrences, and the 110th artwork had the least number of common factors.

In this paper, by comparing the FA algorithm with the traditional algorithm, the operation speed and the accuracy of the results are obtained. The results are shown in Figure 9.
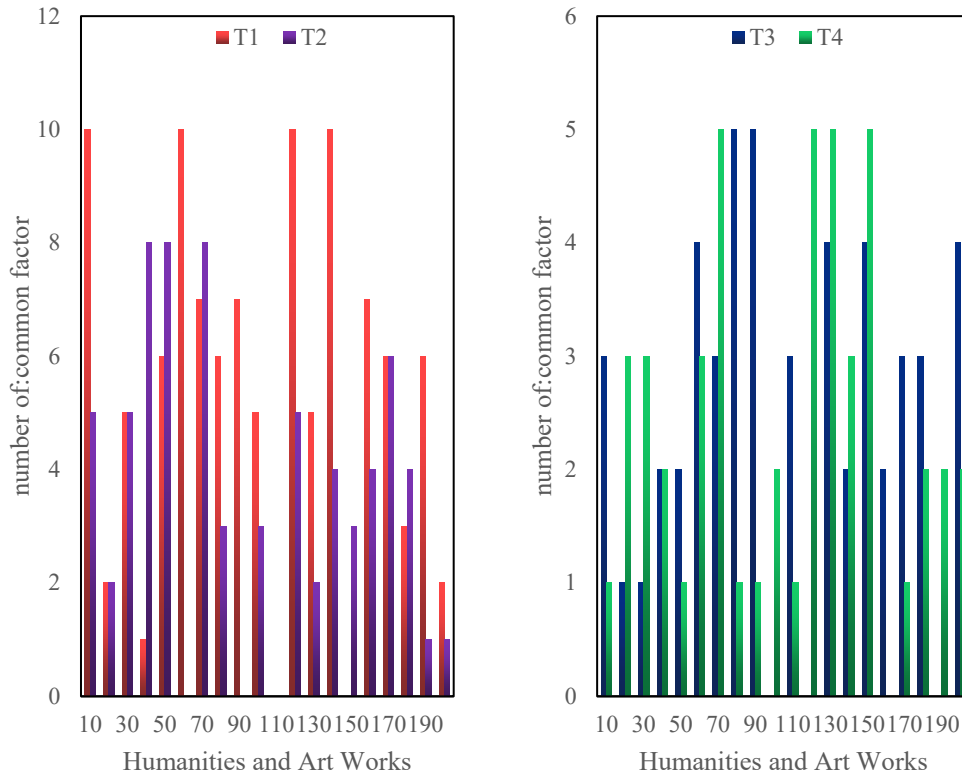
(a) T1 and T2 aesthetic ideas   *(b) T3 and T4 aesthetic ideas*

Figure 8: Distribution of ecological aesthetic ideas
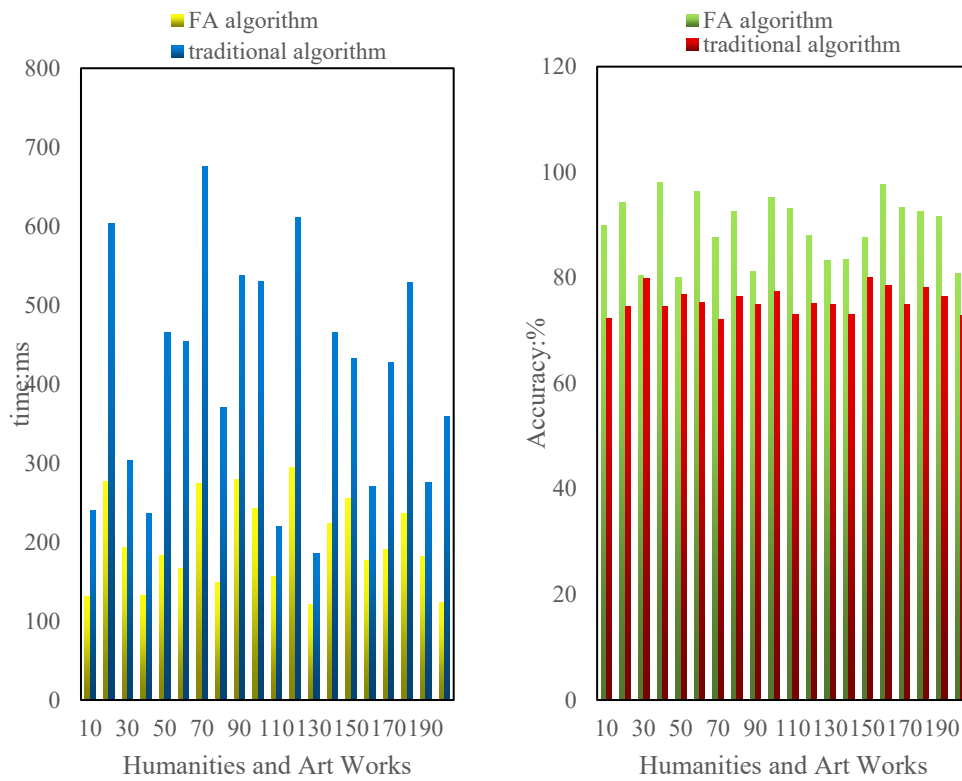
(a) Calculation time   *(b) Calculation accuracy*

Figure 9: Analysis speed and accuracy comparison of ecological aesthetics

It can be seen from Figure 9(a) that the calculation time of using the FA algorithm to analyze each

artwork was as low as 121ms and as high as 295ms; the average time was about 200ms per piece. The calculation time of traditional algorithm analysis was as low as 186ms and as high as 675ms. The average time was about 410ms per article, which was more than twice that of FA. From Figure 9(b), it can be seen that the FA algorithm in this paper had a minimum accuracy of not less than 80% and a maximum of 98% for the extraction of common factors of ecological aesthetics; the average accuracy was 89.3%. The accuracy of the traditional algorithm was only 80% at the highest and 72.1% at the lowest; the average was about 75.6%, which was 13.7% lower than FA. This showed that it is faster and more accurate to use the FA algorithm to analyze the ecological aesthetics in traditional humanities and arts.

6. Conclusions

In the early days of the People's Republic of China, due to the backwardness of the economy, it vigorously developed the economy, thus ignoring the protection of the ecological environment, which resulted in serious damage to the ecological environment. With the rise of China's economy and the improvement of people's living standards, people have higher requirements for the ecological environment, and ecological aesthetics have gradually become popular. In China's long history of cultural changes, many traditional humanities and arts have been born. These humanities and arts are the crystallization of ancient wisdom, which also contains many ecological aesthetic ideas. If the idea of ecological aesthetics can be fully extracted from these humanistic and artistic works, it would surely promote the development of ecological aesthetics and become the well-being of contemporary human beings. For this reason, this paper started from the concept, development and application of ecological aesthetics, and understood the characteristics of ecological aesthetics. After that, this paper conducted research on traditional humanities and arts, and learned some representative thoughts and works of traditional humanities and arts. In the last part of the experiment, this paper understood the general types of traditional humanities and arts through a questionnaire survey. Four important ecological aesthetic ideas were obtained through the selected humanities and art works, and through the comparison of FA and traditional analysis methods, it was concluded that FA has the advantages of being faster and more accurate. However, there are also some shortcomings in this paper, among which the design of the experiment is not comprehensive enough, and the application of the algorithm is not enough, so this paper needs to be further improved and improved.

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