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Retraction

Retracted: Innovation and Research of Digital Artwork Design Based on Big Data and Integrated Media

Journal of Function Spaces

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope

(2) Discrepancies in the description of the research reported

(3) Discrepancies between the availability of data and the research described

(4) Inappropriate citations

(5) Incoherent, meaningless and/or irrelevant content included in the article

(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] W. Zhai, "Innovation and Research of Digital Artwork Design Based on Big Data and Integrated Media," *Journal of Function Spaces*, vol. 2022, Article ID 6333688, 10 pages, 2022.

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Research Article

Innovation and Research of Digital Artwork Design Based on Big Data and Integrated Media

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We are in the era of big data, and art, which has developed along with human history, has been given new vehicles and forms of creation with the use of integrated media technology. This study first introduces artwork and its definition and classification, then briefly describes the definition and development of digital art, and focuses on the development, contribution, and drawbacks of digital artwork NFT (nonfunctional token). This study divided the design model into four layers based on the neural network calculation of factorization machine to build, and the data of each layer was analyzed and processed to build the FNN algorithm model. It was found that the largest proportion of NFT artworks circulating in the trading market is in paintings, at 55%. The HSV color space was selected as the color perception model, and then the picture pixel positions were determined, and redundant pixels were eliminated. To avoid data overflow, the spatial memory occupied by the pixels of the painting was calculated. The results showed that the growth of pixel space complexity was smooth and converged to a straight line, indicating that the original pixel data extracted in this experiment was stable. The circle was selected as the basic guideline for the creation of four digital art paintings with an overall uniform but innovative style.

1. Introduction

Computer technology has achieved an explosive development after 2000, and along with the popularity of computers and smartphones, the number of Internet users has shown an exponential growth. Technological advances have also led to the rapid development of the Internet, and the amount of information available to humans today is now dozens or even hundreds of times greater than before [1]. The massive amount of information has brought convenience and also brought the problem of information overload, which is a great challenge for both producers and users of information. Specifically for art creators, the content they produce is easily overwhelmed by the huge amount of data and does not stand out from the rest. Users of information are faced with a huge amount of information, and it is difficult to filter out the truly useful information, making time and energy wasted [2]. In the era of rapid changes, there are new technological miracles every day, and most of these miracles are created by having innovations. A well-known American entrepreneurialist once said that mankind is experiencing a silent revolution, and this revolution is a profound revolution in the spirit of innovation. In today's globalized economy, innovation has become the first driving force of world development. And in the field of art creation, innovation has the same important status.

Neural networks are new and advanced big data processing technologies that have received much attention in recent years and have been used in every bit of human life and production [3]. Neural network algorithms are inspired by the activity of human consciousness, and scientists have invented artificial neural networks in the field of artificial intelligence, which is the most fundamental root of the modern technological building of mankind [4]. Human consciousness is the product of constant transmission of information transmitters between neurons in their own physiological structure, and only by constant transmission and circulation can they think continuously. And humans constantly adjust and update the connection weights between neurons in order to perform better and faster thinking activities. Human consciousness is nonlinear and generates new signals with increasing knowledge and

experience, and these new signals cause new stimuli to the neurosynapses, which in turn generate new thoughts [5]. Artificial neural networks operate on the same principles as the human mind activity, where data is passed, processed, handled, and distributed at various nodes. Like human consciousness, it adjusts to changes depending on the input signals and has the same adaptive and autonomous learning capabilities as humans. Neural network nodes in computer technology are as important as human neurons, and the number of nodes and the way they are connected determines what kind of nonlinear mapping capabilities they have [6]. Factor decomposer-based neural networks are the earliest and currently more developed artificial intelligence network techniques, which use error backpropagation to train the data. The biggest feature of digital art is that it can strip off the internal relationship of color and graphics to directly express logic. This internal relationship is built on operation and data, and operation is the essence of cognition. The difference between digital art and previous art forms is that the internal logic used is similar to the essence of things, rather than guiding people to read and understand the internal relationship through appearances. Therefore, the final result presented by the data is the content directly reaching the essence of painting. It does not need to have the texture, color, composition, and other representations formed on the surface of traditional painting but a new image represented by the logic composed of internal relations. In essence, digital painting is not a type of painting art, and it is only a type of digital art with painting form or graphic characteristics.

Digital artworks are unique in the era of big data, and virtual artworks only emerge when technology has developed to the extent it has today [7]. Digital artwork is a visual representation created using computer technology and related software, where the related software varies depending on the type of artwork. Digital art paintings would use drawing software, digital art statues would use modeling software, and digital art songs would use arranging and mixing software. The fusion media technology provides the right conditions for the creation and development of digital art, which can only be created, disseminated, sold, and collected so smoothly and easily if all the multiple media are used wisely [8]. However, just like traditional art, digital artists also encounter creative bottlenecks. The huge demand in the art trading market indicates a huge potential for development; so, this study will use algorithms to create a relevant model based on big data melting media technology. The model will then be used to bring innovation and inspiration to the creation of digital artworks. In summary, this study has strong relevance and great digital business value.

2. Overview of Digital Artwork

Digital art is essentially the same as traditional art, an artistic practice, except that the tool for its creation has become computer technology [9]. Art has been present in our culture since the dawn of mankind. Painting, sculpture, music, photography, and games have progressed along with mankind, and they have given him spiritual food about beauty. Because of the advancement of global digitization, more and more artists are creating digitally and do not materialize them but exist only as pixels [10]. This virtual property does not make digital artworks more or less valuable but more convenient to store and transmit and more topical. It is possible to distinguish digital art from traditional art in terms of output methods, which are often used for digital output. It is also flexible and diverse. For example, a video collection of Super Bowl football stars' scoring moments can be a work of art, a symbol abstracted from a real photograph can be a work of art, and an emoji packet that is widely distributed on the Internet is also a digital work of art [11–13].

Digital art is gaining more and more attention, and after being affected by the epidemic, the number of various types of digital art exhibitions is increasing year by year because of its ability to be held on the Internet. Various types of well-known academic institutions have also established big data integrated media disciplines and digital art research centers. However, because of its systematic nature, it has three major congenital deficiencies at the beginning. The first is the problem of copyright protection. Compared to traditional artworks, digital collections only need to copy the station body to complete the copy. And it is more easily tampered with the creator's ideas and style can be easily borrowed and copied. Secondly, the current dissemination channels are limited, and both offline and online channels have different degrees of restrictions on the display of digital artworks. Traditional places such as galleries, museums, shopping malls, and parks prefer to exhibit physical artworks, as traditional artworks usually do not require special equipment such as digital screens. Although the number of online art exhibitions is increasing year by year, it is still insufficient in relation to the huge number of artworks. The final point is that the lack of trading volume and the inability to circulate commercially greatly limit its development. Traditional art can be auctioned at Christie's and Sotheby's and can also be circulated in various art galleries, antique streets, and e-commerce platforms [14]. Because of its easily copied nature, for a long time, there was no trading channel for digital art at all.

Digital art is usually not the digitized original text data and the original audio/video data itself, but when these original materials are designed into a larger digital work through computer technology and information art and become a part of this large work, we can call it digital art. The emergence of nonfungible token (NFT), however, is well positioned to overcome all three of these shortcomings. NFT emerged as a new wave in the art world, becoming known in 2020 and causing a surge in the trading of digital art by the end of 2021.The emergence of NFT has led to sudden overnight riches for artists who were not famous and has led many already famous artists to devote themselves to its study and creation. The landmark event of NFT was the sale of The First 5000 Days by American programmer Michael Winkelmann at Christie's for $70 million [15]. To this day, it is not only artists various creators who sell NFT but also traditional game maker Konami has created its Castlevania-themed NFT for sale, eventually making over $160,000 in profit [16]. Figure 1 shows the iconic NFT content.

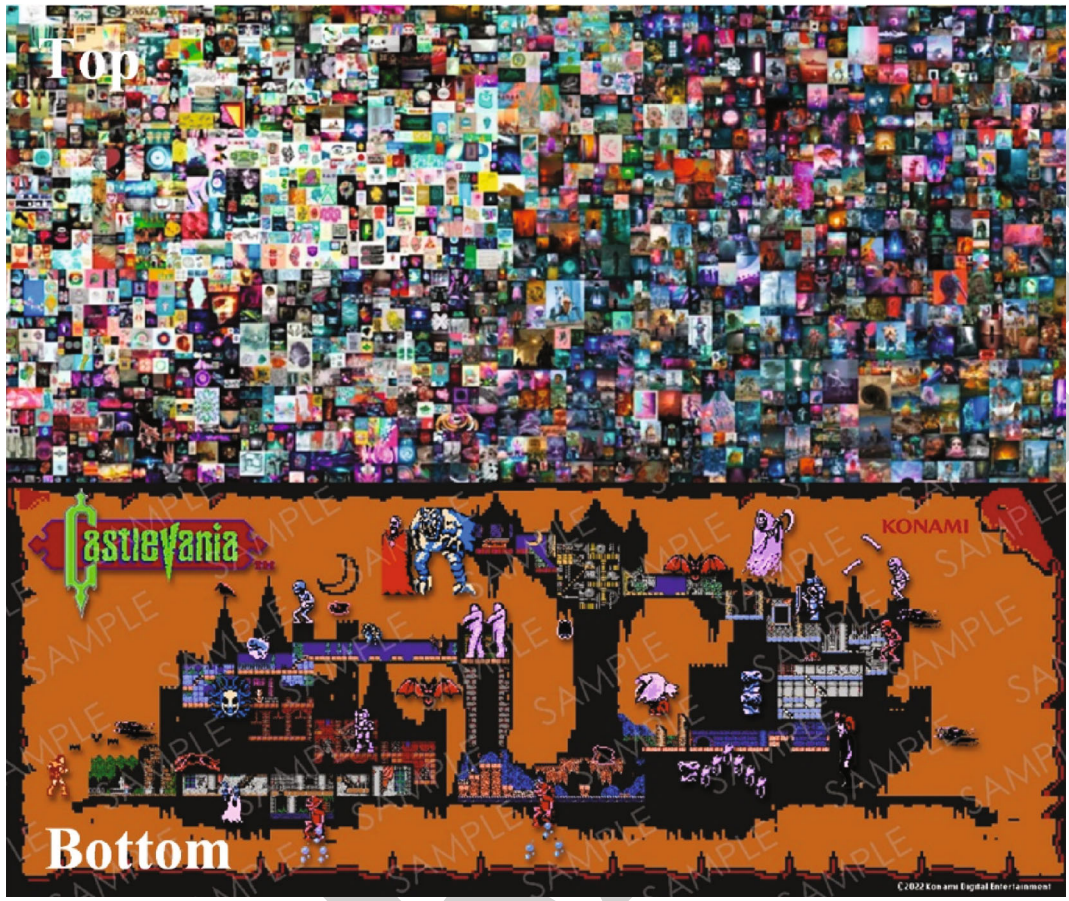

Figure 1: Iconic NFTs: The First 5000 Days by Beeple (top) and Konami's Castlevania-related works (bottom).

NFT is unique in terms of copyright, creation, and trading, and these characteristics set it apart from digital artwork in the traditional sense. In terms of copyright, everyone in the Internet can download, copy, share, and collect NFT artwork, but its owner holds the only genuine artwork. Each NFT item has a unique encryption code; so, it can be queried and traced by everyone in the blockchain, which eliminates the possibility of it being forged and pirated. In terms of creation, NFT is more free, and modern art can intercept the classic artwork for the artist's own expression and interpretation to form a new NFT artwork. The most outstanding feature is that in terms of transactions, the same as copyright transactions are also completed on the blockchain, which eliminates the possibility of fraudulent transactions. And as with securities investments, similar to stocks where one share can be purchased, NFT can be purchased in pieces [17]. These features, especially the trading measures, have led to an unprecedented boom in the NFT digital art trading market. Such a market has first attracted traditional visual content creators in advertising, film and video, and games. Numerous content creators have transformed into NFT art creators, allowing them to break away from the endless demands with their A-side clients and apply their accumulated technical and design talents to the digital art field. Second is the entry of traditional majors in the consumer field, with large companies such as Coca-Cola, Nike, and Adidas relying on their own products and marketing resources in the layout of the NFT art field [18]. The booming market has also given rise to specialized trading sites, and currently, the world's first and largest NFT trading site is OpenSea, which accepts individuals and art groups to post and buy and sell NFT digital artworks on it.

Behind the boom in the market, NFT has also revealed many problems. The first and foremost is that the NFT art market is controlled in the hands of a few people, and its share basically follows the rule of two or eight. About 20% of NFT digital artwork holders occupy 80% of the value of the market, which makes it difficult for ordinary people to profit from this market, which is not conducive to the long-term development of the market [19]. Secondly, because of the lowering of the creation threshold, the identification of artwork value is in a vague and confusing state, and there is no authoritative organization or institution that can identify the reasonable value of a digital artwork [20]. This adds a great deal of uncertainty to the market, making it less stable.

3. Neural Network Algorithm Based on Factorization Machine

The currently used CTR designs are linear models, such as logistic regression, Bayesian and plain Bayesian, and FTRL. Linear models use a large number of sparse one-hot codes

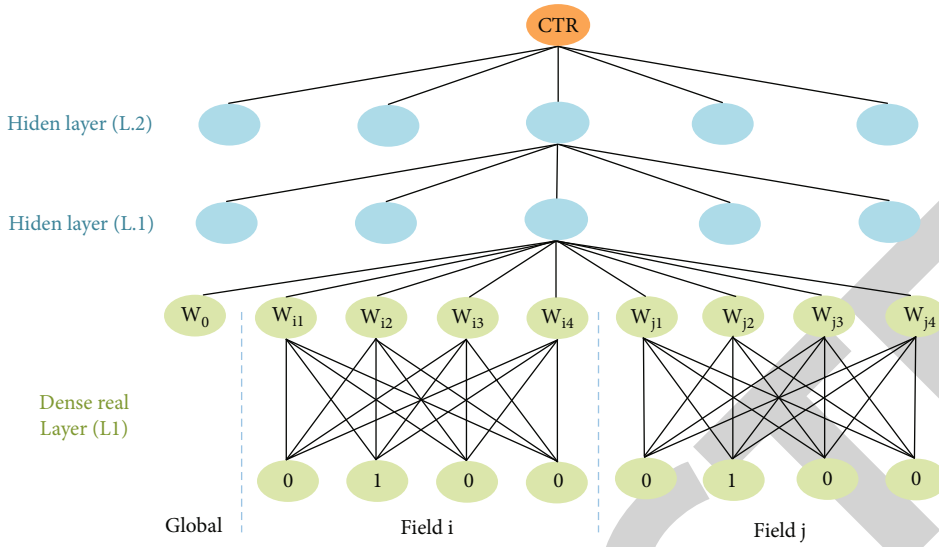

Figure 2: Four-layer FNN algorithm model structure diagram.

for computation, which are simple and effective but have poor performance and cannot design complex relationships between features. The nonlinear model is an algorithmic model that maps binarized features to a low-dimensional space on the basis of the linear model and designs the relationship between features by inner product, which eventually leads to improved performance [21]. The gradient boosting tree algorithm is its representative, by constructing a tree and thus achieving automatic learning. However, both linear and nonlinear models are severely limited in expressiveness and have poor generalization ability.

In the linear model, the common way to extract high-order features is based on manual and prior knowledge. When the feature dimension becomes large, the feature combination becomes extremely difficult, and the labor cost becomes more expensive. The factoring machine is a neural network system embedded with embedded layer. Its main function is to construct hidden variables between features, which measure the second-order combined features based on all features. Neural network algorithms can be learned and designed from the original features before achieving a high-dimensional feature representation through unsupervised training. The Factorization-machine supported Neural Network (FNN) algorithm selected for this study can perform cyclic supervised learning using FM. Thus, sparse features are effectively reduced, and continuous dense features are obtained. On top of the embedding layer, this experiment constructs a multilayer FNN for digital artwork design modeling.

With one-hot encoding, the FNN algorithm inputs category features that are fielded. It has multiple cells, each representing a specific field with only one positive value, and the others are negative. The features, after encoding, are represented in the following Figure 2.

The top layer above will output a real number, and the bottom layer is the FM layer. The probability of its click is expressed by the following equation.

$$\hat{y} = \text{sigmoid}(W_3 l_2 + b_3), \tag{1}$$

where l_2 is the input feature of the layer in which it is located, which can be calculated by Eq. (2).

$$l_2 = \tanh\left(W_2 l_1 + b_2\right). \tag{2}$$

tanh is the activation function selected for this study, and l_1 in the function is the original feature input value, calculated as

$$l_1 = \tanh\left(W_1 z + b_1\right), z = \left(w_0, z_1, z_2, \cdots, z_i, \cdots, z_n\right). \tag{3}$$

The number of domains is represented by n in the above equation, and z_i denotes the vector parameter in the i-th domain, calculated as

$$z_i = W_0^i \times x[\text{start}_i : \text{end}_i] = \left(w_i, v_i^1, v_i^2, \cdots, v_i^K\right). \tag{4}$$

Initialization of the vector FM of the first layer yields

$$y_{\text{FM}} = \text{sigmoid}\left(w_0 + \sum_{i=1}^{N} w_i x_i + \sum_{i=1}^{N} \sum_{j=i+1}^{N} x_i x_j\right). \tag{5}$$

With the above computational steps, the FNN algorithm can improve the model learning ability and get more potential data relationships. Continuing to add the weights of the implied layers to the algorithm model for calculation, the choice of using SGD for the prediction of FM weights can effectively reduce the computational effort. Firstly, all four layers are initialized using the crossloss function.

$$L(y, \hat{y}) = -y \log \hat{y} - (1 - y) \log (1 - \hat{y}). \tag{6}$$

Since the input elements have only one positive value, then back propagation can be used to update the weight values and make the FNN algorithm model more effective in learning.

Then, the regularization process is carried out, and there are two mainstream regularization methods, namely, L1 regularization and L2 regularization. L1 regularization is done by adding an absolute value to the loss function, and the common formula is

$$L(\theta) = L + \lambda \|\theta_i\|_1. \tag{7}$$

Similar to the L1 regular, the L2 regular also adds a parameter to the loss function but switches the Eulerian parametrization, and its expression is

$$L(\theta) = L + \lambda \|\theta_j\|_2. \tag{8}$$

A comparison of the two shows that the L1 norm prefers smaller scale algorithmic models because the sparsity of the solutions computed is stronger. Therefore, the L1 regularization does not give too much weight to the outlier features, and the result will lose some accuracy. Also, in order not to overfit, the L2 regularization is used in this study, and the regularization process is as follows.

$$\Omega(w) = 2\|W_0\| + \sum l = 3\left(\|W_l\|^2 + \|b_l\|^2\right). \tag{9}$$

Calculate the error generated by each iteration of the FNN neural network as

$$\delta_j = \frac{\partial L}{\partial z_j} = \frac{\partial L}{\partial a_j} \times \frac{\partial a_j}{\partial z_j} = \nabla a_j \times \sigma(z_j). \tag{10}$$

Vectorization is then performed to obtain the following:

$$\delta^L = \nabla a^L \odot \sigma(z^L), \tag{11}$$

where $\odot$ is the product of the corresponding weight values. Recursion of the error for each layer again leads to the calculation of

$$\delta_j = \frac{\partial C}{\partial z_j} = \sum_k \frac{\partial C}{\partial z_k} \times \frac{\partial z_k}{\partial a_j}, \tag{12}$$

$$\sum_k \delta_k w_{kj} \sigma(z_j) = \sum_k \delta_k \times \frac{\partial (w_{ki} a_i + b_i)}{\partial a_j}. \tag{13}$$

The gradient of the algorithmic model weights of FNN is

$$\nabla w_{jk} = \frac{\partial C}{\partial w_{jk}} = \delta_j \frac{\partial (w_{ki} a_i + b_i)}{\partial w_{jk}}. \tag{14}$$

The bias gradients for each layer in the model structure are

$$\nabla b_j = \frac{\partial C}{\partial b_j} = \delta_j \frac{\partial (w_{ji} a_i + b_i)}{\partial w_{ji}}. \tag{15}$$

Within this gradient range, and taking into account the error of the obtained results, the final digital art design model based on the neural network algorithm of the factorization machine is obtained.

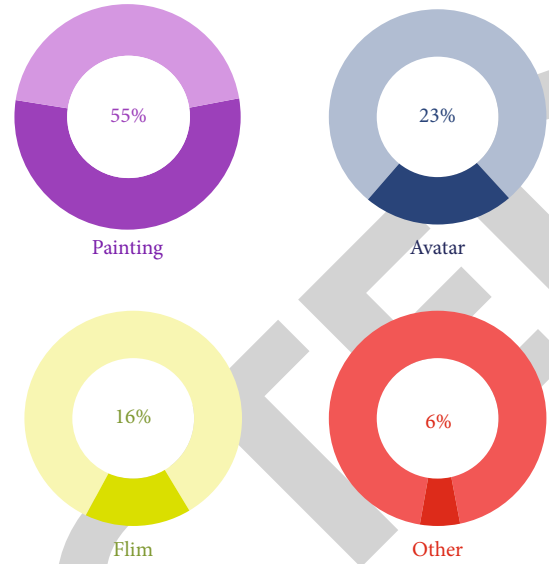

Figure 3: Proportion of different types of NFT artworks circulating in the trading market.

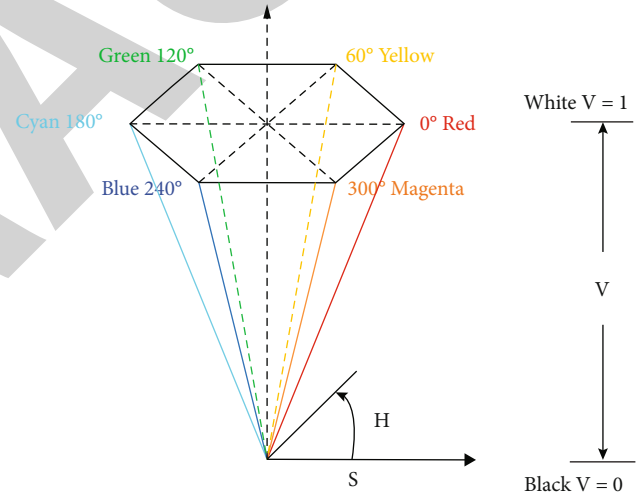

Figure 4: Hue, saturation, and value color space model structure diagram.

4. Examples of Digital Artwork Design and Its Analysis

4.1. Percentage of NFT Types. Before using the FNN algorithm model for digital artwork, also known as NFT goods for creation, this study conducted statistics and analysis of the collected big data. It was found that the proportion of different types of artwork in NFT is roughly the same as in traditional artwork, but there are some differences, and the results are shown in Figure 3.

The statistical proportion chart is clear that the largest proportion of NFT artworks circulating in the trading market is in paintings, at 55%; in second place are avatars that

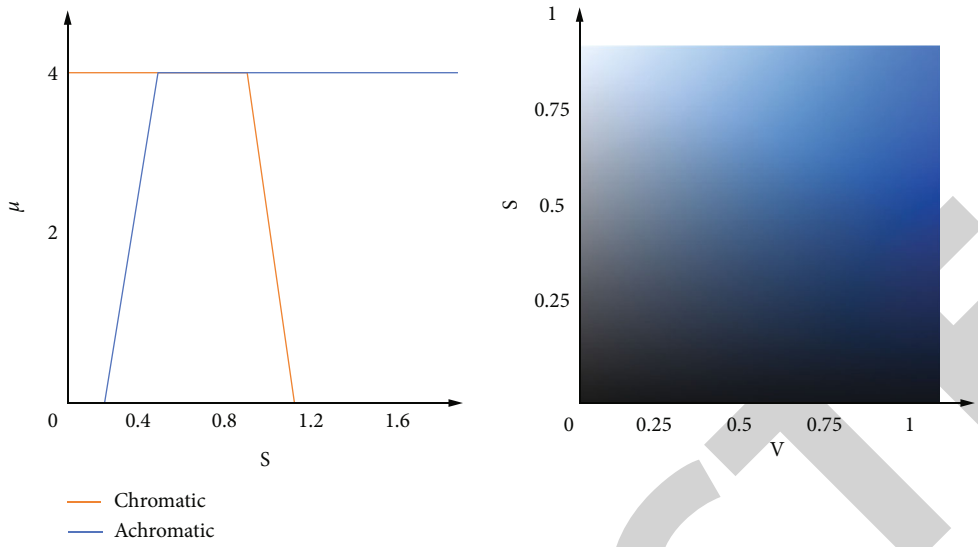

Figure 5: Variation of color with S and V at $H = 0$ (left) and S-component fuzzy set partition (right).

do not exist as traditional artworks, accounting for 23% of the total, because the rise of design software in the Internet has given rise to the creation of avatar art. This is followed by film and television works, which account for 16% of the total. The reason for the lower percentage is that the equipment needed to shoot a film and the technical threshold required of the creator are much higher than that of painting. By analyzing the above data, and considering the arithmetic cost of the algorithm and the creation cost, this study decided to use the model established in the previous section for the design of digital artworks of paintings.

When creating digital art, another difference from traditional art painting is that digital artwork needs to be presented on different display devices. Therefore, it is necessary to select a uniform color standard, so that the viewer can see the artwork on different display devices with a certain degree of uniformity. This experiment uses HSV (hue, saturation, value) color space, which is the most widely used model of human visual color perception. It characterizes color by its luminance, hue, and saturation, and its structural model is shown in the following Figure 4.

It is obvious from the figure that the HSV color space is structured as an equilateral hexagonal cone, with black at the apex of the equilateral hexagonal cone because the luminance of this point is 0. White is located at the center of the bottom of the equilateral hexagonal cone because the luminance of this point is 1, the point with the highest luminance. As indicated by the central axis on the left side of the figure, V represents the brightness of the color, and the colors on the central axis represent all the colors of this gradient from black to gray to white. h is the hue of the color, and the six prongs of the equilateral hexagonal cone represent the six main colors of this model, where 0° is red, 60° is yellow, 120° is green, 180° is cyan, 240° is blue, and 300° is magenta. These prisms are arranged equidistantly around the central axis, from 0° to 360° containing all the colors visible to human vision. s refers to the saturation of the color, a parameter used to characterize the purity of the color. The

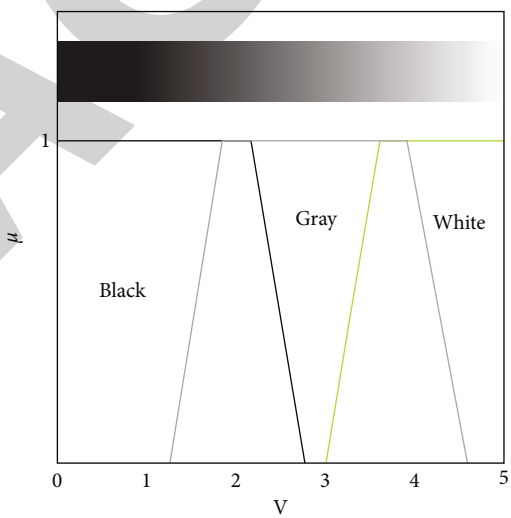

Figure 6: Plot of ceramic material color as a function of V and V -component fuzzy set partition.

dots in the diagram represent colors, and the closer the dot is to the central axis, the less saturated the color is. h, s, and v represent luminance, hue, and saturation, respectively, and are three separate color parameters, one of which can be adjusted at will without affecting the other two. Therefore, the NFT digital artwork can be designed in a wider range of choices, without considering the mutual influence of various color parameters, effectively improving the efficiency of the model calculation.

Figure 5 shows the color change (left) of S and V and the result of S-component fuzzy set division (right) when $H = 0$. The display of color on different screens follows the general rule of color, if the color is less saturated, it means that the purity of this color is lower. When saturation is low, it is more grayish in human visual perception. As shown in the left image above, when the saturation is 0 and the luminance

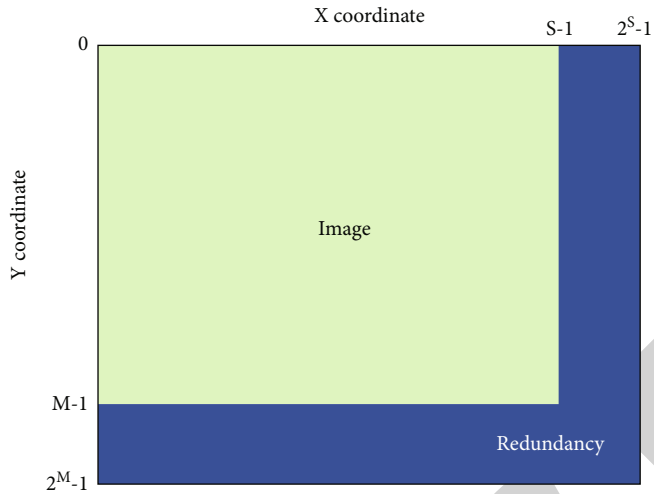

Figure 7: Effective color pixel and redundant color pixel map processed by the algorithm model.

is close to 0, the color near the vertical axis is perceived as black, regardless of the hue. When the saturation is still 0 and the hue is also close to 0, the color near the horizontal axis is perceived as black to gray to white as the brightness increases. Only when all three are in a suitable interval will humans perceive this color as it was traditionally perceived. Therefore, in the image difference prediction model, a trapezoidal blurring of saturation will be performed using the fuzzy method, and then the right image in the above figure is obtained. Again, because of the corrected subjectivity in the human eye's perception of color and noncolor, there is an overlap between the two regions.

As shown in the black and white gradient diagram above, when both saturation and color values are 0, the normalized interval of luminance is 0 to 1, showing a gradual process from black to gray and then from gray to white. This display leads to the inference that the most intuitive difference in noncolor for human perception is the difference in luminance. Therefore, trapezoidal blurring of noncolors using the fuzzy method again yields the right panel in the above figure. Similar to the trapezoidal blurring results in Figure 6, there are overlapping areas of black and gray and gray and white because of the human eye's own reasons.

Then, the pixel positions of the painting artwork screen to be created are determined, the target color pixels and redundant color pixels are analyzed using image processing, and the results are shown in Figure 7.

The green part in the above figure is the valid pixel area, which is the block of pixels that can be used by the FNN algorithm to design the model, while the blue part is the redundant pixel area, which needs to be removed during the design. The redundant pixels include both pixels that overlap with the valid pixels and pixels that contain useless information, both of which interfere with the computation of the model and slow down the computation. Both types of pixels interfere with the computation of the model and slow down the computation. In addition, redundant pixels deviate from the original color scheme of the design, and

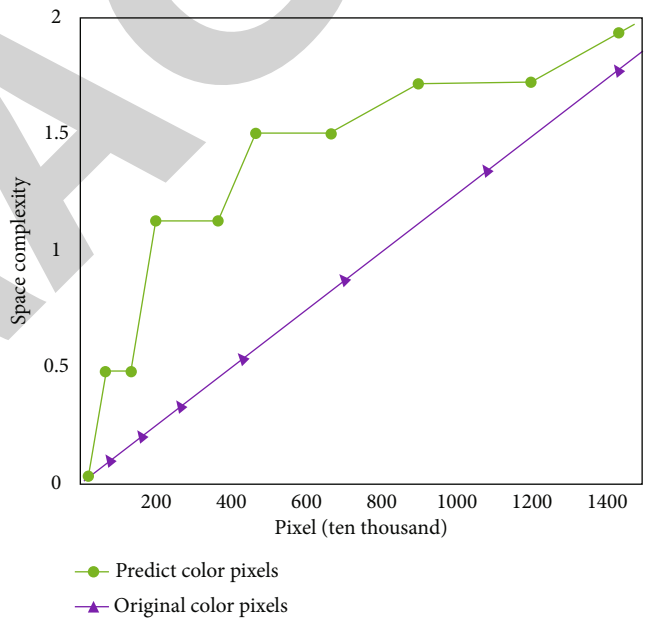

Figure 8: The spatial complexity of the original color matching pixels of digital artwork and the resulting pixels after design.

their presence gives the designed digital artwork a dirty look and must be removed.

In order to avoid data overflow, the spatial memory occupied by the extracted color-matching original pixels and the pixels obtained after performing the design are also calculated and considered. There is a special processing algorithm for overflow color. Like the chroma key, you need to know the color of the matting target, which is the basis for removing the overflow color. The YUV space of the original image is transformed, and then the original signal is processed according to the chromaticity and saturation information of the target color (that is, the color of the overflow color), the color similar to the overflow color is removed from the original signal, and then the image processed by

(a) (b)

(c) (d)

Figure 9: Four digital art paintings drawn with a circle as the artistic creation concept using big data fusion media technology.

the overflow color is superimposed with the new background to achieve the purpose of removing the overflow color. The growth of the original pixel space complexity is smooth and tends to be a straight line, indicating that the original pixel data extracted in this experiment is stable. In contrast, the pixel data of the color to be designed shows an exponential growth, indicating that the data obtained from the design contains larger information, and that the design results are more accurate with higher spatial complexity. The detailed and intuitive data structure is shown in the following Figure 8.

After determining the color rendering mode as HSV and the grayscale processing, the final idea of the digital artwork was confirmed. The circle is the perfect embodiment of geometry, and it has different artistic meanings throughout the world. Stars, planets, and satellites can be abstracted as circles; so, in many civilizations, the circle represents the sun or the moon and has a rich poetic character. Moreover, the circle has no beginning and no end and has the meaning of eternal cycle, which can bring people endless imagination. Therefore, this design uses the constructed FNN algorithm model, incorporates the big data technology innovation into the digital art painting, and chooses the circle as the symbol to convey the imagery to create four digital art paintings.

Figure 9 shows four digital art paintings using big data fusion media technology and taking circles as the artistic creation concept. The above four digital art paintings are drawn according to the design concept by feeding the instructions to the algorithm model. The overall background is black, conveying the mood of mystery and the unknown and reminding people of the deep universe. In the first digital painting, the circle creates a viewpoint from the cave, and the bird-like creatures in the circle create the image of a scary giant. In the second painting, the silhouette is replaced by a cluster of buildings, and a mirage of urban architecture appears in the lower half of the circle, adding a sense of mystery to the unified style. The rows of straight lines in the upper part of the circle can be seen as clouds, which form

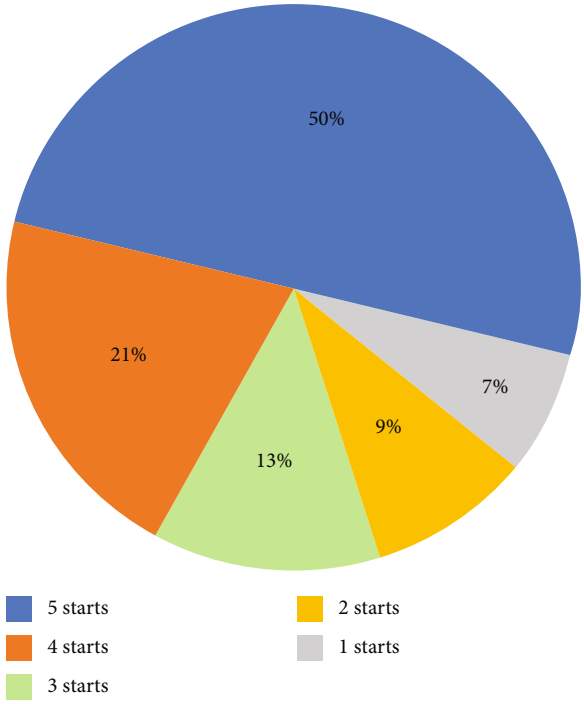

Figure 10: Graph of website users' ratings of four digital art paintings.

a great sense of oppression to the buildings on the screen and make the whole painting more artistic tension. The third painting abstracts the circle into a stack of books, and the overall wooden color style gives the painting a warm life. The last digital art painting is very different from the first three, in which the round body is made into a cave with an arched door, except for the gray ground near the cave, which is endlessly black. The archway is surrounded by blue and orange lights, and the lower part of the picture is reflected by water, giving the whole painting a visual focus, and the light and water expand the three-dimensional and spatial sense of the picture. After the creation, the study also uploaded the four digital art paintings to the NFT trading site OpenSea for sale.

After a period of selling on the website and average scoring by OpenSea, this study counted the popularity of these four digital art paintings, and the results are shown in Figure 10.

About half of the website users gave a positive rating of 5 out of 5 stars, and about 21% more gave a high rating of 4 stars, indicating that the paintings created using the data algorithm in this paper received a high average and good popularity. However, about 7% of users still expressed that they could not understand the artistic ideas conveyed by the paintings, which indicates that there is still room for improvement in this algorithmic model.

5. Conclusion

The proportion of different types of art in NFT is roughly the same as that in traditional art. Considering the operation cost and creation cost of the algorithm, this study decided to use the model established in the previous paper to design and draw digital artwork. The most widely used visual color perception model HSV color space is selected. It characterizes color by brightness, hue, and saturation. Determine the pixel position of the artwork to be created and use image processing to analyze the target color pixels and redundant color pixels, including pixels overlapping with the effective pixel information and pixels containing useless information, both of which will interfere with the calculation of the model and slow down the calculation speed. The pixel data of the color to be designed increases exponentially, which indicates that the data obtained from the design contains more information, the design result is more accurate, and the spatial complexity is higher. Finally, the circle was selected as the basic criterion for creation, and the algorithm model constructed by big data integration technology was used for artistic creation. Four digital art paintings with unified overall style were obtained, but each one focused on performance. The results show that the spatial complexity of the original pixel increases smoothly and tends to be straight, which indicates that the original pixel data extracted in this experiment is stable. However, art is a huge system, which contains the endless pursuit of beauty. Therefore, there are still a lot of unknown topics that need to be studied and explored by relevant personnel.

Data Availability

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

Conflicts of Interest

The author declares that there is no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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