

## *Retraction*

# **Retracted: Computer Vision-Based Art Color in the Animation Film Performance Characteristics and Techniques**

### **Journal of Sensors**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) Manipulated or compromised peer review

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] R. Zhang, "Computer Vision-Based Art Color in the Animation Film Performance Characteristics and Techniques," *Journal of Sensors*, vol. 2021, Article ID 5445940, 12 pages, 2021.

## Research Article

# Computer Vision-Based Art Color in the Animation Film Performance Characteristics and Techniques

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If an animated film wants to present extraordinary visual effects, the successful use of art colors is the key to the success or failure of an animated film. Although our country's animated film started a short time ago, its development has been slow. In modern times, it is difficult to compete with excellent animation works of other countries; animation is an art form that requires the combination of modern technology and traditional cultural areas. Chinese cartoons are gradually declining today when the technology is taking off. The reason is that the traditional culture of the country has not been thoroughly explored. In today's diversified world, if you want to revive the brilliance of Chinese animation, you must deeply and systematically study various elements of national art and form your own creative thinking and creation system. Particularly under computer vision, the gap is very obvious. Under the computer vision, in order to study the characteristics and techniques of the use of fine art colors in animated films, to promote the development of animated films in China, this article analyzes the role of art color in the animation of excellent Chinese and foreign animation works in recent years, through literature analysis, comprehensive qualitative and quantitative analysis, etc., to study the meaning and application of color symbols, hoping to be a Chinese animation providing useful help for film creation and development. Studies have shown that color has a strong influence on animated films. A good use of artistic color can add a lot of color to an animated film. According to statistics, art colors account for at least 20% of excellent animation works, which can be integrated into animation colors. Animation works with domestic characteristics are easier to succeed. This shows that the use of artistic colors can play a key role in animated films.

## 1. Introduction

In today's society, people's pursuit of beauty is constantly improving. Beauty is everywhere in life. People's lives are colorful, and the rich colors of dress make us bright and beautiful; the color of food makes our appetite; the comfortable residence makes us feel warm and cozy; the color makes our urban homes refreshing [1]. The importance of color to us can be seen. It is closely related to our lives and is our first impression of the beauty of the world. Great material satisfaction has fostered the pursuit of higher people's spiritual culture. Watching movies, reading books, playing games, watching exhibitions, etc., people will choose their favorite movies, paintings, or reading works according to their own understanding of beauty, so as to enrich their spiritual

world. For art creators, if they want to serve the public, they must create excellent works for audience appreciation [2].

As we all know, the artistic expression of color animation is different from other types of art. Animation is an artistic form of "movement," including the movement of characters, the movement of the scene, the movement of the lens, and the use of montage. It is very similar to the movie, but it is not a movie. And "painting" is related to the picture. The picture needs color settings. The picture is the audience's first impression of the film, which determines the aesthetic value of animation to a large extent [3]. Then, we can say that sportiness and timeliness have become the necessary attributes of animation colors. In modern movies, color has become an important expression code for telling story plots. This requires that the color expression of the lens

picture should be consistent with the theme content and the development of the story plot. The color changes with the development of the plot. As an important expressive code in the film, color can organically integrate the emotions, anger, sorrow, and other situations, and play a role in the narrative development of the film.

Animated film is rich in structure beauty; it is composed of pictures, scenes, and paragraphs. The most basic constituent codes are the constantly moving and changing graphics and colors [4]. The tones of different pictures and scenes in the film change with the development of the plot. Just like a movement, each note will change with the needs of the tune, but it is also the basic code for composing a harmonious movement. The tone of the film will show changes, but the range of changes is always limited by the overall color tone of the film. It is the contrast of different tones that forms the overall tone of the film. The rational use of color is related to the success or failure of the art creator's work. It glows with magical charm all the time, and it is also true in animation art. Today, the level of animation production in different countries of the world is developing rapidly. And animated films come into our lives with new features and expression [5–7]. Therefore, many experts at home and abroad have conducted research on animated films.

Wang believes that color is an extremely important part of animated films, which affects the style and quality of animated films. He briefly introduces the characteristics and aesthetics of color in animated films and emphasizes the color in animation. The shaping of characters, the warmth of the scene, and the overall impact on the animation film expounded the importance of color in the animation film and strengthened the importance of color in the animation film [8].

Yang believes that in a good animation work, color is a huge improvement in the work and can play a vital role. In his opinion, the scene design of animation must be suitable for color, focusing on the analysis of the role of color and scene in animation, briefly analyzing the relevant characteristics of color, and introducing the methods, means, and how to use color in animation scenes. Improve the quality of the entire animation work through the rational use of colors [9].

Zhang believes that color is an important part in movies and even art and literature. Color can promote the development of the story. The author gives the subjective consciousness and imagery of the relevant characters in the story by changing the color, so that the whole movie story is more complete. By enumerating the famous Japanese director Hayao Miyazaki, through the application of color in Miyazaki's films, it illustrates the important role of color in animated films [10].

Research by these experts has given some later explanations of the use and importance of color in animated films, but because the related research is too theoretical, they have no in-depth understanding of the characteristics and related methods of color in animated films. This article uses coupling theory to link art color and animated films. Use data analysis methods to verify and create relevant models. It clarifies the characteristics and application of the art color in the animation film in detail, which can provide certain research for later researchers Reference value.

## 2. The Characteristics and Methods of Using Art Colors in Animated Films

### 2.1. Art Color Is Reflected in Computer Vision Calibration.

As an expressive art, animation has a broader artistic expression space than live-action movies. As the main component of animation, color code is subjectively expressive. The so-called subjective expression of color means that the artist designs and constructs the color composition under the guidance of subjective consciousness. In the film, the director designs or changes the color of things related to the role according to the theme and the plot needs to highlight the personality and changes of the role [11]. Due to the expressive power of color symbols, its artistic allure can therefore be felt and understood by the viewer's instincts. It has a strong symbolic and allegorical effect. It has a strong symbolic and metaphoric effect. The film and television shooting system is shown in Figure 1.

Color itself is just a physical phenomenon, but people will feel the emotion conveyed by color according to their own visual experience. Once a certain color echoes the viewer's visual experience, it will trigger a certain emotion. In short, the colors in the film can have an impact on the mood of the audience and have symbolic significance [12]. The expression of the animation determines the individuality of the color coding. And the bold use of color often presents a unique situation [13, 14]. Character recognition is shown in Figure 2.

For animated films to be reflected in computer vision, we define a rectangular coordinate system on a computer image as an image coordinate system  $(a, b)$  which has two unit modes: pixel unit mode and physical length unit mode, respectively,  $(ab)$  and  $(x, y)$  indicate. In the  $x$ -axis and  $y$ -axis directions, the physical size of each pixel on the computer's image sensor on different axes is  $fx, fy$ , and these two parameters are known parameters [15]. It can be seen that in the image coordinate system, the conversion relationship between the pixel value  $(a, b)$  and the coordinate  $(x, y)$  is as shown in

$$\begin{aligned} a &= \frac{x}{fx} + a_0, \\ b &= \frac{y}{fy} + b_0. \end{aligned} \quad (1)$$

By assuming that there is a point  $P$  in the three-dimensional space, the camera coordinates of this point are  $(x_1, y_1, z_1)$ ,  $p$  is the corresponding point of the space point  $P$  on the image, its coordinate value is  $(x, y)$ , and the focal length is  $f$ . The principle of perspective projection can be derived from the relationship:

$$\begin{aligned} x &= f \frac{x_1}{z_1}, \\ y &= f \frac{y_1}{z_1}. \end{aligned} \quad (2)$$

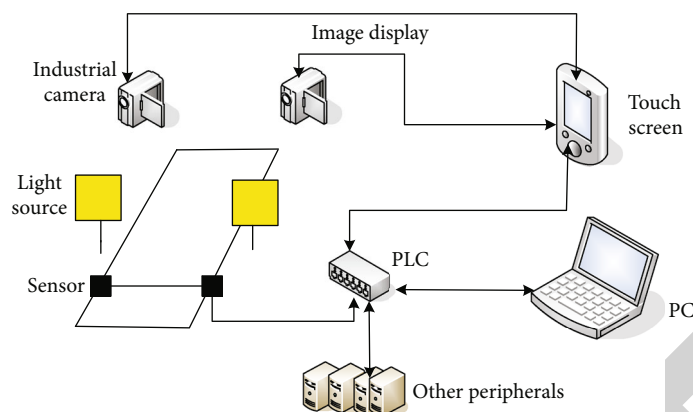


FIGURE 1: The film and television shooting system.

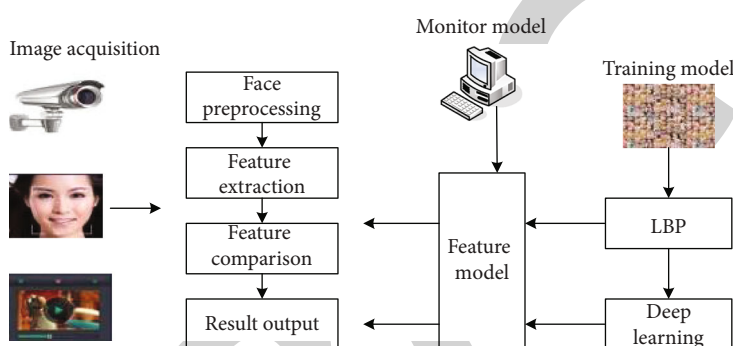


FIGURE 2: Character recognition.

**2.2. Animated Film Research Methods.** As a unique film category, an animated film is the most subjective one. This is related to its inheritance relationship with painting art. Its code is not a simple realistic symbol, but an artistic aesthetic symbol, because painting art itself is very expressive and ideographic. Anything with ideographic character is a kind of symbol, and the main form of animation is the image symbol of plastic art and the change of symbol [16]. As an important visual code in animated films, color has different meanings in different contexts. According to the different semantic functions, color can be divided into two categories.

One is that color symbols are reproducible. Under the strong visual stimulation, color symbols can produce intentional beauty. In the production process of intentional beauty, the strong emotional tone is incorporated into the color symbols, so that the color symbols have sublimated emotional factors. The color symbols, together with the sense of rhythm and other rhythms in life, create a more complex beautiful image [17, 18]. Figure 3 shows the processing of movie characters.

The second is that the expressiveness of color symbols will interact with images, sounds, symbols, and expressions in the surrounding environment in the process of expressing emotions. This enables the original color symbols to strengthen the original language meaning and add new environmental semantics. Therefore, color symbols have the conversion function of information symbols. In the plot

development of animated films, color symbols can further stretch and strengthen and highlight the semantics, laying the tone for the development of the plot. The use of color symbols can highlight the emotions of the characters from the side, arouse the audience's emotional and psychological resonance, and achieve the purpose of semantic transformation [19].

In order to study the techniques and characteristics of the use of art colors in animated films, this article adopts the following research methods:

- (1) Data analysis refers to the process of analyzing a large amount of collected data with appropriate statistical analysis methods, extracting useful information and forming conclusions, and then conducting detailed research and generalization of the data. In the field of statistics, some people divide data analysis into descriptive statistical analysis, exploratory data analysis, and confirmatory data analysis; among them, exploratory data analysis focuses on discovering new features in the data, while confirmatory data analysis focuses on the verification or falsification of existing assumptions [20]
- (2) Comprehensive quantitative and qualitative analysis methods

Quantitative analysis is to analyze the data of the problem, using the intuition and clear essence of mathematics

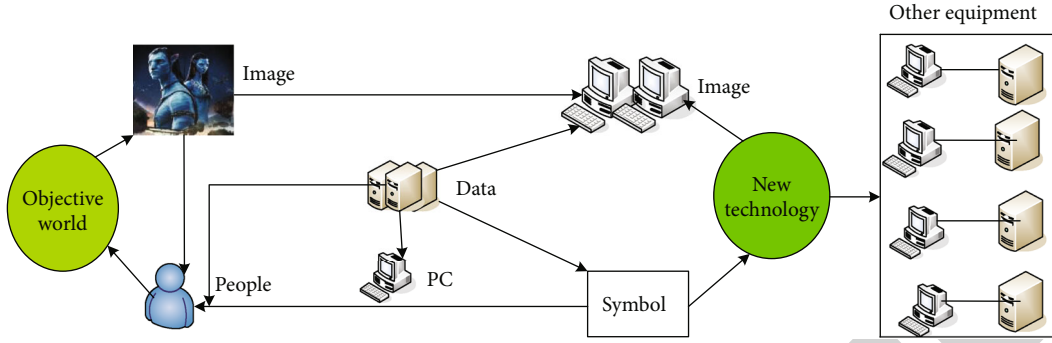


FIGURE 3: Processing of movie characters.

to reflect the existence of the problem; qualitative is to collect, read, and organize the relevant theoretical results of the relevant domestic and foreign research literature induction. The criteria for assessing the efficiency of an environmentally friendly supply chain are complex and varied. This includes not only financial standards but also other standards that are not financial. Some standards cannot be directly analyzed in a quantitative way but can only be evaluated by a qualitative analysis method. Green supply system. The performance evaluation standard system of China is constructed using a combination of quantitative and qualitative analysis methods. At the same time, it provides formulas for standard calculations and evaluation standards [21].

When we are using comprehensive quantitative and qualitative analysis, we need to calculate the relevant error values. The average error is the average of the difference between all individual observations and the average value. The average error formula related to hue is

$$\vartheta_{ij} = \frac{\sum (i_n - i_j)}{x}. \quad (3)$$

In the same way, we can get the color shading error formula as

$$\vartheta_{yj} = \frac{\sum (y_n - y_j)}{x}, \quad (4)$$

$$f(m_i) = h(h(m_i) \| f(m_{i1}) \| f(m_{i2}) \| \dots \| f(m_{ip})).$$

According to these two formulas, we can get the absolute error formula of color as

$$\delta_{ij} = \frac{\sum |i_n - i_j|}{x}, \quad (5)$$

$$f(B_i) = h(B_i).$$

**2.3. Art Color Application Techniques and Characteristics.** Animation is a dynamic art. The ideographic nature of color symbols is not only the rendering of static pictures, but more importantly, the atmosphere rendering and context expression of the constantly changing shots. The director can play

the role of rendering emotions and artistic conception through the grasp and use of colors, the performance in the shots, and the combined use between shots [22].

Refer to the definition of color optical illusion in various fields. Color optical illusion mainly refers to the phenomenon of error or distortion when people observe external things under the influence of external factors such as light, color, and shape. When this optical illusion is mainly in terms of color, the illusion of color is formed.

$$S_{\text{etup}}(1^k) \longrightarrow \text{param.} \quad (6)$$

The characteristics of color in animation are as follows:

- (1) The art of reproduction comes from life. And the colored symbols are repeatable too. As film and television arts, animated films must first create colors in reality. Particularly, commercial animation is a popular art, which is restricted by popular culture and will be used. More statutory color symbols can gain the resonance and understanding of the audience and complete the symbol process, such as normal human skin color, natural ocean color, sky, and earth color [23, 24].

From the perspective of prototype theory, the essence of various characters in animation is the concrete image of human collective cognition and emotion of real things. Their creative laws must also be within the scope of human cognition. The use of colors in animation is often a creative reproduction of realistic colors

- (2) Expressive art is higher than life. The creative process of art is to transform realistic symbols into aesthetic symbols. The color in the animation is highly subjective. Through the artist's creation, he reflects the scene to be expressed on the screen. It is the product of the artist's refining and processing of realistic experience. It is not simply a copy of life. Animation is a complex of multiple art forms, and color symbols, as one of the important code components in animated films, are organically combined with other codes to produce aesthetic images [25–27]

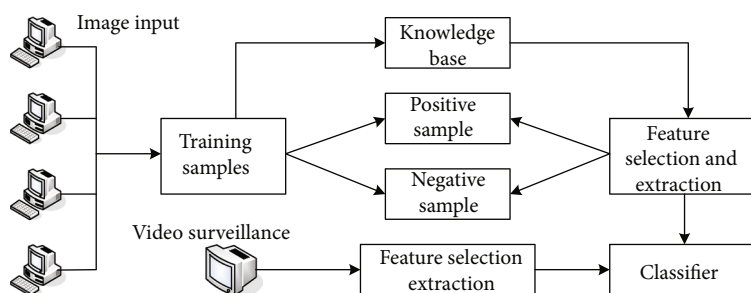


FIGURE 4: Computer vision recognition.

(i) The combination of color symbols and time. Film is the art of time, and the picture changes with time to have the possibility of narration. This is also the fundamental feature of film art that distinguishes it from other graphic arts. Animated film is a special type of film, and its main form is the symbol of plastic art and the change of symbols. Color symbols change with time, no matter how stable a certain color is, there must be a certain time limit. The music, which is also the art of time, forms the melody by the changes of notes over time. The color symbols in animated films are equivalent to notes, and the change of color symbols over time is equivalent to rhythm., and the change in color symbol over time is equivalent to a stroke. The tone of the film is equivalent to the melody. It is the combination of color symbols and time that constitute the tone of the film to complete the narrative [28]

(ii) The contrast between the color symbols and the change of the color symbols of the animation film determines the successive contrast of the color symbols of the animation film. If the color symbols in paintings are simply a simultaneous contrast relationship, then the color symbols in the animation film have both simultaneous and sequential contrast relationships. In the early days of the animation film, the production staff painted the patterns on a two-dimensional plane in the form of hand-painting and then composed the moving pictures by continuous patterns [29]. Each frame of the animation can be regarded as a separate picture, and the simultaneous contrast effect of color symbols refers to the color relationship within the same picture [30]

In animated films, the color matching of the characters often meets the personality requirements of the characters. In the animated films, the characters have a set social status, life background, and personality. The story development of the entire film must revolve around these characters. The color setting that meets the requirements of the characters is particularly important. In them, we can appreciate the characters' strength and bravery, weakness and timidity, justice and loyalty, and treacherous and cunning [31].

TABLE 1: Animation works.

	Scenery description	Detailed description	Symbolic description	Realistic description
2015	7	3	4	4
2016	9	4	5	5
2017	9	4	6	3
2018	12	6	4	2
2019	8	4	5	4

2.4. *Coupling Theory.* Coupling theory is the main theory based on this research. The term coupling degree first appeared in physics. It refers to the measurement of the degree of association between circuit modules. At first, it was mainly used in engineering research such as communications and machinery. Later, this concept was also introduced in economics research [32, 33]. Coupling refers to a dynamic combination of mutual restriction or promotion or evolution formed by multiple similar systems or motion modes through various interactions and influences. The coupling system composed of multiple subsystems has the characteristics of integrity, relevance, diversity, and coordination. Its integrity refers to the combination of different subsystems according to the new law of motion; the relationship refers to the ability between the subsystems. Mutual influence, interaction, there are different degrees of relevance; diversity means that the various subsystems can be reorganized according to different influencing factors, resulting in different types of coupling systems; coordination means that the coupling subsystems vary with difference. The change of factors affects and recombines, resulting in the diversity of the coupling system and enhancing the degree of coordinated development between systems. In short, the degree of coupling is to describe the degree of interaction and mutual influence of different subsystems in the same coupling system.

Let the variable be the sequence parameter of the color animation film composite effect system and be the  $b$ th index of the  $a$ th sequence parameter Stark. But they are two subsystems that influence each other. The contribution of the order parameter in the subsystem to the degree of ordering of the system can generally be realized by integration methods such as linear weighting.

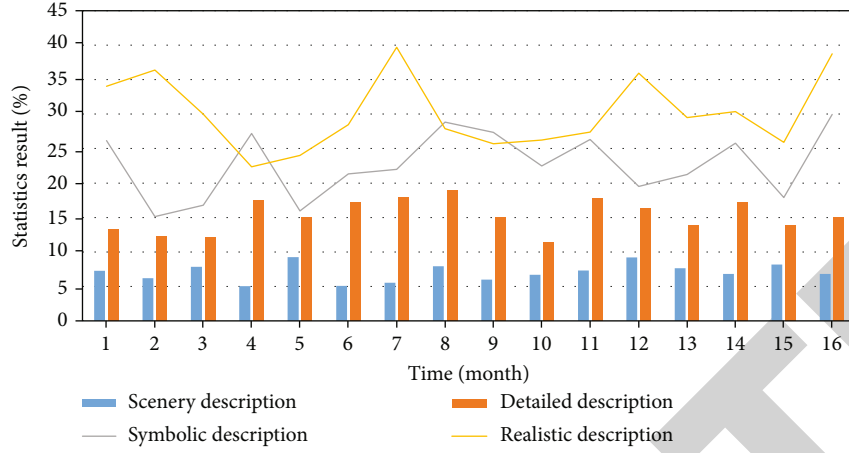


FIGURE 5: Expression techniques in animated movies.

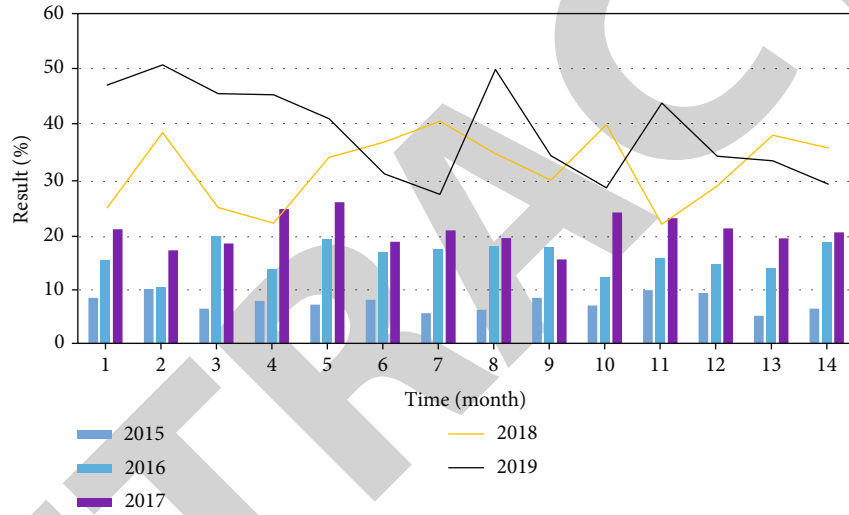


FIGURE 6: Animation performance method classification.

TABLE 2: Some additional information for the 4 official trailers used as known positive data.

Movie title	Trailer duration (hh: mm: ss)	fps
Prometheus	00: 01: 30	35
The Dark Knight Rise	00: 00: 39	35
Transformers 3	00: 00: 30	35
Inception	00: 00: 53	15

TABLE 3: Basic information of the data set.

Data set	Number of samples	Dimension
USPS	2500	242
BCI	4000	227
g241c	2500	242
g241n	2500	242
Text	2500	2296
WDC	569	24

TABLE 4: The influence of art color on film.

Number of works	Importance	Drift value ( $f_x$ )
5	Unimportant	$0 \leq f_x < 0.05$
13	General	$0.06 < f_x < 0.15$
32	Important	$0.16 < f_x < 0.2$
50	Very important	$0.21 < f_x < 0.3$

$$m_a = \sum_{b=1}^n \lambda_{ab} \vartheta_{ab}, \quad (7)$$

$$f(m_1) = h(h(m_1) \| f(m_4) \| f(m_2) \| f(m_3) \| f(m_5)).$$

Among them is the contribution of the subsystem to the ordering degree of the higher education-industrial structure composite system, and the weight of each order parameter.

Let  $m_1$  and  $m_2$ , respectively, represent the color change of art and the animation film effect system, and their

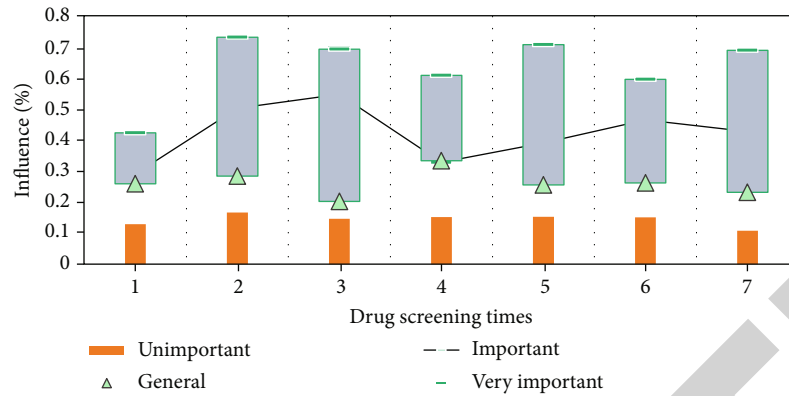


FIGURE 7: The influence of color on animated films.

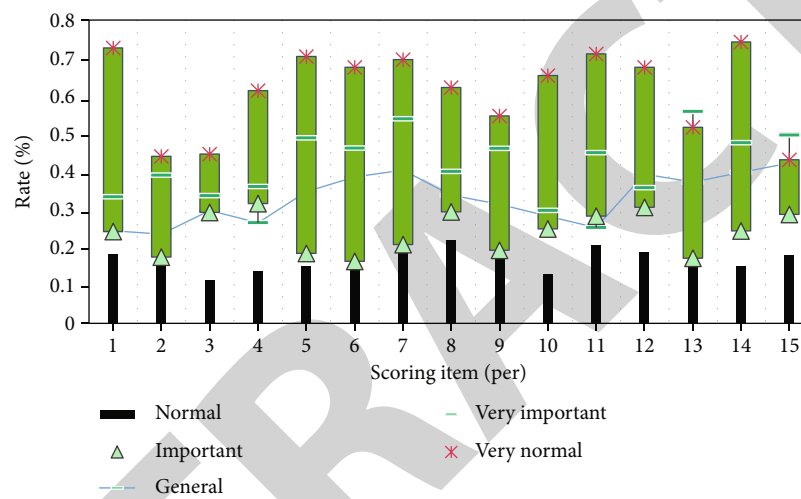


FIGURE 8: How does color affect animated films.

TABLE 5: Classification comparison of semisupervised learning algorithms.

Data set	SVM	CK-means	TSVM	S3VM (setting 2)
USPS	86.1 ± 8.1/58.1 ± 11.1	81.9 ± 11.0	81.1 ± 3.8/81.6 ± 4.9	61.4 ± 8.9/85.8 ± 9.4
BCI	88.5 ± 1.9/80.0 ± 0.1	66.1 ± 0.1	50.9 ± 1.8/51.1 ± 1.1	88.6 ± 1.91/85.9 ± 4.5
Text	51.1 ± 3.0/51.6 ± 4.0	88.0 ± 0.5	53.3 ± 8.3/51.8 ± 5.1	43.0 ± 4.5/46.4 ± 6.4
Australian	81.6 ± 6.8/84.8 ± 9.1	51.8 ± 15.4	81.1 ± 6.1/88.0 ± 8.1	84.3 ± 8.91/85.1 ± 8.9

development level is represented by  $m_1$  and  $m_2$ , respectively. The dispersion coefficient is used here to express the degree of coordination between the research art color  $m_1$  and the animation film system  $m_2$ , reflecting the degree of variation or dispersion between the two. The smaller the coefficient, the greater the degree of coordination. The calculation formula for calculating the coefficient  $Q$  is as follows:

$$Q = 2 \left( 1 - \frac{m_1 m_2}{[(m_1 + m_2)/2]^2} \right)^{1/2} \quad (8)$$

The smaller the  $Q$  value, the higher the degree of coordination between the art color and the animation film system.

TABLE 6: Animation works at home and abroad.

Years	Domestic	Foreign
2000-2005	3	15
2006-2010	5	22
2011-2015	6	28
2015-2020	9	33

When  $Q = 0$ , the deviation of the two systems is the smallest, and the coordination degree of  $m_1$  and  $m_2$  is the highest. Therefore,  $Q$  can be used as a measurement index of the coupling degree between  $m_1$  and  $m_2$ .



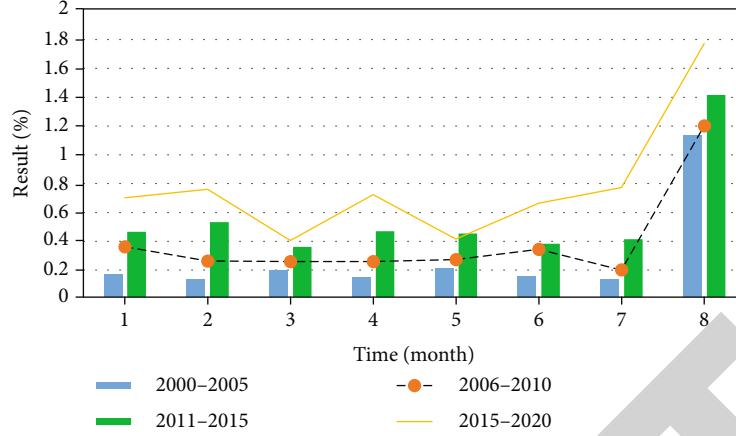


FIGURE 9: Excellent animation films at home and abroad.

The coupling degree model is established as follows:

$$Q_n = \left\{ \frac{(m_1 * m_2 \cdots m_n)}{[\pi(m_s + m_k)]} \right\}^{1/n}, \quad (9)$$

$$\mu_j = \sum_{\{(i,v_i)\} \in Q} v_i m_{ij} \in Z_p.$$

For the convenience of analysis, the coupling function  $Q$  of art color and animation film can be expressed as

$$K = \frac{2(m_1 * m_2)^{1/2}}{(m_1 + m_2)}, \quad (10)$$

$$\phi = \prod_{\{(i,v_i)\} \in Q} \sigma_i^{v_i} \in G.$$

The value range of  $Q$  is  $[0,1]$ . When  $Q = 0$ , it indicates that the subsystems are in an irrelevant state; when  $Q = 1$ , it indicates that the optimal coupling between the subsystems is achieved using the median segmentation method. Computer vision recognition is shown in Figure 4.

Then, it will be the evidence of data integrity.

$$Q = \left\{ \left\{ \mu_j \right\}_{1 \leq j \leq s}, \sigma, \{h(m_i), \Omega_i\}_{1 \leq i \leq c}, \text{sig}_{sk}(f(R)) \right\}. \quad (11)$$

Send it back to TPA of cloud audit end.

$$M(\sigma, G) = e \left( \prod_{\{(i,v_i)\} \in Q} h(m_i)^{v_i} \cdot \prod_{j=1}^s u_j^{\mu_j}, V \right). \quad (12)$$

### 3. The Application Experiment of Fine Art Color in Animation Film

**3.1. Experimental Purpose.** This article is based on the theoretical results of industrial economics and sports industry economics, draws on the theoretical research results of sports industry structure at home and abroad, and uses liter-

TABLE 7: Basic information of the movie.

Movie title	Duration (hh: mm: ss)	fps
The Dark Knight Rise	01: 44: 31	13
Transformers 3	01: 34: 11	13
Iron Man 3	01: 10: 31	13
Men in Black 3	01: 45: 50	13
Pirates of the Caribbean 4	01: 16: 14	13
X-Men 2	01: 13: 47	13
Thor 2	01: 51: 03	13

TABLE 8: Animation works at home and abroad.

Hue		13
Color	Bright tone	12
	Dark tone	11
Saturation	Strong tone	9
	Light tone	4
Chromaticity	Cool colors	21
	Warm tones	13

ature, comparative research, mathematical statistics, logical analysis, and other methods, from the application of color to animated films. In terms of the influence of animated films, the application of art colors in animated films is deeply analyzed, and the characteristics and application methods of art colors in animated films are discovered.

**3.2. Subject.** This paper establishes the art color and animation film model through the computer and studies and analyzes the key technologies in the detection system by changing the relevant art color. It is mainly divided into four parts, namely, the hue and darkness, the color warm and cold, the character perception, and the plot promote. Through these four parts, understand the characteristics and application of art colors in animated films.

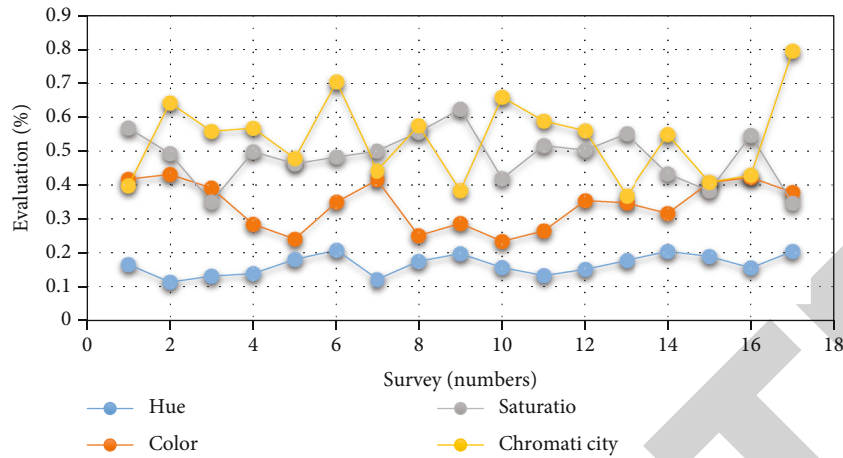


FIGURE 10: The use of color in animated films.

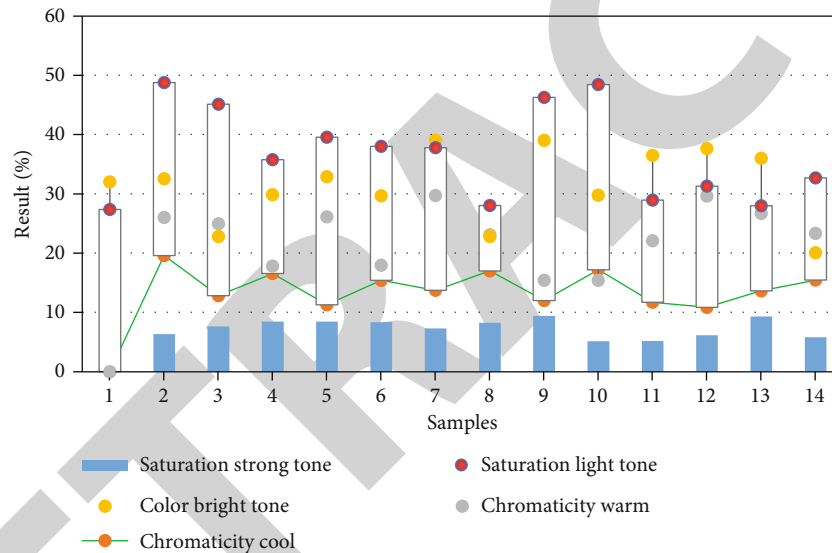


FIGURE 11: The use of color in animated films.

3.3. *Evaluation Criteria.* This paper adopts the mean shift algorithm, which was first proposed by Fukunaga and Hostetler, but it has not attracted widespread and effective attention and sufficient attention in the academic circles. In 1995, Y. Cheng made an important improvement to the mean shift algorithm, which greatly expanded the effective application range of calculation. At this time, scholars in academia discovered the effective advantages and characteristics of this algorithm and began to interest and pay attention to this algorithm. Since then, the academic community has paid more and more attention to this algorithm. The effective advantage of the algorithm is that it can find the template along the maximum direction of the gradient, so that the algorithm does not need to search the whole world, and the real-time performance is high. The calculation formula is as follows:

$$f_{(x)} = \frac{1}{nk^a} \sum_{y=1}^n p\left(\frac{x-x_i}{k}\right). \quad (13)$$

- (1) The amount of calculation required by this algorithm is relatively small. When the target area is known, the real-time performance is better, so it can achieve better real-time tracking
- (2) The mathematical model used makes the algorithm less affected when the specific object is abnormal

#### 4. The Application and Characteristic Analysis of Art Colors in Animated Films

4.1. *The Use of Colors in Animated Films.* Through the statistical analysis of nearly 100 excellent animation works at home and abroad in the past five years, the statistics of the different uses of gourmet colors in the animation works are used to find the characteristics. Specific statistics are shown in Table 1 and Figures 5 and 6.

From the above chart, we can clearly see that in the excellent animation works of the past five years, there are mainly 4 expression methods commonly used, of which the description of scenery is the most prominent, followed by the use of symbolism to describe the animation movies. Some additional information for the 4 official trailers used as known positive data is shown in Table 2.

These two performance methods accounted for 62% of the total. We can think that excellent animated films are inseparable from the description of scenery and symbols. Basic information of the data set is shown in Table 3.

**4.2. The Role of Art Color in Animated Films.** Through the computer-built related model, we distributed one hundred online questionnaires to count the role of the relevant people on the role of art color in animated films and conduct a qualitative and quantitative analysis of the data. Specific statistics are shown in Table 4 and Figures 7 and 8.

From the chart, we can see that people have a clearer understanding of the important role of art colors in animated films. In this statistical result, only 18% of them believe that art colors are not important. It accounts for the vast majority. This shows that color plays an important role in animation movies for most people. When we create animation movies, we must not ignore the role of art color. Classification comparison of semisupervised learning algorithms is shown in Table 5.

**4.3. Comparison of Chinese and Foreign Excellent Animation Movies.** Through the statistics of the animation films that have been popular at home and abroad in recent years, and the use of art color in these works, we can study the art color elements in the animation film. Specific statistics are shown in Table 6 and Figure 9.

From Table 7, we can clearly see that there is a large gap between the number of outstanding animated film works in my country and foreign works. In this regard, due to the shrinking of the animated film market in my country, people's investment and attention are not high; on the other hand, it is due to the gap between our economy and other countries. However, from the overall trend, my country's excellent animation works are constantly increasing. For example, Qin Shimingyue and Mei Xing in recent years indicate that my country's animation films are catching up. Basic information of the movie is shown in Table 7.

**4.4. The Use of Art Colors in Animated Films.** The application of art color in animation generally includes hue, color brightness, saturation, and color. We use the art color in the animation work Lion King to understand the application and technique of art color. Specific statistics are shown in Table 8 and Figures 10 and 11.

From the chart, we can see that Shiziwang is very proficient in the use of art colors, and the switching between cold and warm tones is very mature. The changes in color contrast the scene transition without destroying the integrity of the story. The process of the story has a great facilitating effect, and we must also learn from its excellent experience.

TABLE 9: The relationship between the time required to learn SVM and the amount of data.

Data sampling ratio	Training time	Forecast accuracy	Training data size
1 : 1	About 3 days	74.7%	27692 KB
2 : 1	About 26 hours	72.1%	12811 KB
3 : 1	About 12 hours	70.6%	8556 KB
4 : 1	About 8 hours	69.5%	6411 KB
5 : 1	About 6 hours	69.0%	5132 KB
6 : 1	About 3 hours	67.5%	4276 KB

TABLE 10: How well these methods match the official trailer.

Movie title	Randomly selected	Our way
Transformers 3	15	24.81
Inception	5.88	22.78
Iron Man 3	3.92	47.06
Men in Black 3	15.13	26.32
Pirates of the Caribbean 4	12.5	28.33
The Twilight Saga	6.45	25.81
X-Men 2	10.17	21.85
Average match	7.92	27.38

The relationship between the time required to learn SVM and the amount of data is shown in Table 9.

China is a big country with a long history and profound cultural heritage. This provides a huge cultural foundation for the creation of animated films. The Chinese nation also has its own characteristics in the use of colors, which provides a source of inspiration for the color setting of Chinese animation production. How well these methods match the official trailer is shown in Table 10.

## 5. Conclusions

Although Chinese animation started relatively early, there is no lack of artistic, ornamental, and ideological masterpieces in history. But since the new century has entered the period of innovation and experimentation, few masterpieces have appeared. This is in sharp contrast with the international awards of foreign animation works. This has to be said that it has a certain relationship with the thinking style and creative goals of domestic animation with children as the audience. It is difficult to carry a deeper ideological connotation for the animation films for the young and easy to understand. This has also become some animation films. The workers are lazy. For the use of colors, we do not pay attention to metaphors, but only look good. As a result, it directly leads to the fast-food of animated films.

Traditional culture is the most important element in animation art design, which is as important as accepting foreign culture. Learning traditional art is not a simple application of layer elements; the use of color is also a key part of it. Primitives used mineral powder and plant colors to protect and decorate themselves during the ice age or use simple colors to paint on the rock screen, as a witchcraft activity and totem worship, to satisfy the spiritual desires of people at that time. The color art has deepened from primitive human nature to have national, regional, ethnic, and individual characteristics. Its decorative and symbolic meanings have been developed to varying degrees. It not only affects people's vision but also affects people's spiritual essence and aesthetic ability. Therefore, it is more urgent and important to understand its meaning and connotation than to understand the basic composition of color. The differences between regions and national traditions make color styles around the world diversified, which is also the reason for the diversification of animation color design, and it is also an important manifestation of national animation characteristics.

Chinese cartoons are gradually declining today when the technology is taking off. The reason is that the traditional culture of the country is not deeply explored. In today's diversified world, if you want to revive the brilliance of Chinese animation, you must deeply and systematically study various elements of national art and form your own creative thinking and creation system. If Chinese animated films want to regain their glory, they must follow the characteristics and application of color in animated films and accurately grasp the degree of audiences in order to make excellent works that the people like to hear.

### Data Availability

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

### Conflicts of Interest

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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