Study on the Fusion of Oil Painting Art and Digital Media Based on a Visual Sensor

Nan Gao and Liya Fu

Dalian Neusoft University of Information, School of Digital Art and Design, Dalian, 116000 Liaoning, China

Correspondence should be addressed to Nan Gao; gaonan@neusoft.edu.cn

Received 19 July 2021; Revised 2 December 2021; Accepted 21 December 2021; Published 20 January 2022

Academic Editor: Haibin Lv

Copyright © 2022 Nan Gao and Liya Fu. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Digital media art is a new type of art with rich sensory experience. Nowadays, digitization is flooding many areas of life. Under the sprint of a large amount of information, human beings have once again entered the digital age. This article is aimed at studying the fusion of oil painting art and digital media based on visual sensors, analyzing the application of digital imaging art using sensor technology in various fields, especially in the field of oil painting art, and analyzing the effects of digital media with the support of sensor technology. The artistic characteristics and rich forms of presentation are presented, and then, the key points of digital media design are summarized. This paper proposes to bring advanced sensor technology into the field of art for research, turning boring and difficult technical data into an interesting art form, making human-computer interaction more compact and humane, and creating better works of art, so that more and more people and different fields can enjoy the scientific and technological achievements. The sensor is a kind of bionics in modern science, which enables machinery to perceive the human environment like human or animal sensory organs, through the perception and detection of this environmental change, and writing a certain program, the signal data is converted into electricity or signal, and at the same time transmit these signals to receiving organs or devices, such as device sensors that simulate organs. The art of digital photography requires the intervention of sensor technology to make interaction and virtue more complete. The sensor technology also requires the art of digital photography to provide an external display window, which can better serve mankind and create greater social value. The combination of technology and art makes the presentation of art more distinctive. The experimental results of this paper show that the integration of oil painting art and digital media based on visual sensors has made digital media have an impact on more than 58% of oil painting art works and made many oil painting art works show an unprecedented sense of science and technology, which is important for future oil painting art. The development of the company has positive significance.

1. Introduction

With the gradual enrichment of materials and the continuous improvement of people’s living standards, art is gradually integrating into the market. Let modern people seek a more comfortable consumption environment and a more satisfying interactive experience, which made digital art a favorite at the time, especially the emergence of digital visual art. Later, it became popular in many fields. Today’s digital imaging projects show the characteristics of visualization and technology. Oil painting art came from the West, more than 600 years after their development during the Greek Renaissance. It has a deep tradition and a long history. The oil painting shows a rigorous shape. This continuous integration of technology and art technology has led to continuous progress in society. At the same time, the related fields of digital visual art are also expanding. From the inside to the outside of the architectural plaza, there is no doubt that this new creative space has entered the art world. It also opened up the world of social economy. A new growth point has opened up. Therefore, the authors believe that the dimensional research of digital imaging art and sensor technology is not only high. Artistic value also has a high market value. In fact, we get the convenience of combining multiple sensors in our daily lives. Humans and animals use a wide range of multisensory systems to adapt to the environment and
increase survival rates. This is the most direct proof. For example, it is difficult for animals to judge food information at close range by sight or touch, but the brain can make accurate judgments by integrating the senses of sight, touch, taste, smell, and other sensory information in the same way as human beings. They will not only rely on sight when it comes to information about their surroundings. Instead, it combines auditory and olfactory information. Sometimes even the "sixth sense" makes people realize the importance of data integration. At the same time, a new sensor technology is emerging. Data integration-related technologies (including theoretical methods and software and hardware processing) to generate real-time data become possible.

Today, multisensor data fusion technology has become a practical technology. Technology has become an interdisciplinary field, including signal processing in probability theory and mathematical statistics, data theory, fuzzy theory, and artificial intelligence. Theories such as pattern recognition, computer graphics, and multisensor data integration technology are widely used in military weapon control, industrial production control self-service robots, monitoring and target recognition, integrated navigation for traffic management, shipping monitoring and fishery, remote sensing for agriculture and animal husbandry, signal fusion, signal processing, image processing, and other fields. With the continuous improvement of socialization, people's communication methods have undergone tremendous changes. People urgently need an art form that can satisfy fast-paced life. The birth of digital image art is to meet the needs of the times and to play an increasingly important role in life. Research on digital art helps us better understand the nature of digital art. And use of a unique form of expression to make digital images plays a better role in oil painting art.

With the rapid development of the digital age, research on the integration of oil painting art and digital media on visual sensors has gradually begun. Wang's article is aimed at studying the exploration of oil painting teaching in colleges and universities under the background of the development of multiart culture. The 21st century is an era of cultural and economic diversification. Oil painting art culture in the 21st century also shows a trend of diversified development. The diversified development of fine arts has had a profound impact on oil painting teaching in colleges and universities. In this article, the author first explains the current trends and prospects of the diversified development of art culture and then points out the development and reform of oil painting teaching in colleges and universities under the background of multicultural art development, hoping to help the development and reform of oil painting teaching in colleges [1]. Sharma et al. pointed out that due to the widespread use of vision machines, image fusion has become a major research area in the past few decades. While making progress in the field of image fusion, a large number of technology-based image transformations and spatial filters have been designed for general and specific image sets. The primary standard of image fusion technology is to provide high-quality visual perception, while giving a considerable objective evaluation rate. In this study, the most recently studied high-performance and state-of-the-art technology based on the information fusion rate was conducted using visible light and infrared image data sets. These techniques have been carefully selected because of their superior performance on objective and subjective evaluation scales and have been discussed based on their respective advantages and disadvantages. Obviously, some fairly primitive technologies can be performed well, and technologies based on various domain mixtures can significantly improve the information fusion rate [2]. Huang et al. mentioned that the visual sensor network (VSN) is extremely vulnerable to attacks due to its open deployment in potentially unattended environments. In order to improve the network security of VSN, an intrusion detection system (IDS) is an effective countermeasure. However, since visual sensors can generate large and dynamic video data, it is a difficult task to quickly and effectively detect attacks in VSN. In addition, there are usually too few attack samples in VSN, and IDS cannot fully understand the attack behavior. Faced with these difficulties, in this article, we propose an effective VSN intrusion detection method, which is based on traffic pattern learning. In the proposed method, a traffic model is developed to describe the dynamic characteristics of network traffic in VSN. Based on this model, the optimal feature set for traffic mode learning can be extracted. Then, a hierarchical self-organizing map (HSOM) is used to learn traffic patterns and detect intrusions [3].

The above-mentioned scholars are very innovative in their understanding of oil painting art and digital media based on visual sensors, but there are still some aspects that have not been paid attention to. Therefore, this article will supplement the aspects that are not covered by the above experts and scholars and start from the sample design. Explore the use of digital visual art and sensor technology from design samples, including applications in education centers and outdoor public art. At the same time, the broad advantages and practical possibilities of this artistic application are enhanced. The application of digital photography art using sensor technology will be widely promoted in the future, and its huge advantage will be to improve people's livelihood and influence people's livelihood to further promote social development.

2. Method of Fusion Research of Oil Painting Art and Digital Media Based on a Visual Sensor

2.1. Oil Painting Art Based on a Visual Sensor. Digital media technology is a professional term for information and communication engineering. The concepts and analysis methods in it are widely used in communication engineering, automatic control, signal and information processing, circuits and systems, and other fields. The art of oil painting comes from the understanding of the outer world of the soul [4]. It is an image that is firmly and objectively expressed in the image through the filtering of the human spirit. This visual language is more than just visual stimulation. But this is not a simple explanation. The painter's mood and other factors often "distort" the appearance, intentionally or
unintentionally. This distortion is not only inevitable. But it is also necessary. Even the most realistic painters inevitably draw objects for the purpose they see. They will inevitably contain personal emotional factors, because the so-called art is actually regarded as an expression of emotion. It is a portrayal of the artist’s inner monologue and is their soul. The claim from the depths is because photography cannot replace painting. Therefore, as a form of expression of oil painting language, it is alive and the result of personal spiritual experience and emotional nourishment. It is a language change of ideas and concepts and an esoteric technique of oil painting art. Virtual image processing and oil painting are not only related to the spatial aspect of the image. But this also involves the artist’s subjective interpretation of the primary and secondary relationship of images, thereby enhancing the clarity in the rhythm of the image [5, 6]. Imagination and reality are not phenomena that exist in the real world, because these objects are real. Imagination and reality are the reflection of our vision on the brain: what we can clearly see is reality. What we cannot see clearly is the image. In terms of space and viewing angles, it is said that due to air barriers and limited vision, the greater the distance, the more blurred the shape and feeling of the body. And the lower the brightness and color contrast, the farther away we think the “real” object; the closer to the “virtual” object, and the farther it is away from us. The application of this rule in painting is a combination of virtual and real objects [7, 8].

2.2. Digital Media. The visual language of graphic design has the characteristic of dependence. It is not like painting, which independently conveys certain information through pictures, but depends on the design of a certain product or a certain concept to carry out the transmission of information. Therefore, the visual language of graphic design should be concise to help people remember as soon as possible. There are three basic types of digital media design [9]. There are network design represented by network traffic design, web page design, video design, network advertisement design, multimedia publishing design, etc. There are also TV packaging design such as column packaging design, web page design, video design, network advertisement design, network publishing design, etc. The content of the digital image is the three-dimensional object in the real three-dimensional space. But it is recorded as a 2D image [10]. This editing method is a three-dimensional editing or editing of a flat image. The perception is caused by its visual experience, but it can still perceive more dimensions in the image. The “spatial sense” we often say comes from the formation of visual perception. Digital media design is a combination of art and technology. The invention of the computer is an important prerequisite for the creation of digital media art. The development and progress of modern technology are the driving force for the continuous advancement of digital media art. Therefore, it is a highly integrated technical product and art that invented digital media art. Digital imaging and scanning can easily digitize graphics and images. The advancement of various image processing technologies provides us with a convenient way to edit special effects in images. The invention of fractal technology allows us to use 3D animation to depict landscapes, flowers, and trees [11]. This technology mainly studies theories, methods, technologies, and systems related to the acquisition, processing, storage, dissemination, management, security, and output of digital media information. It includes various information technologies such as computer technology, communication technology, and information processing technology. Comprehensive application technology, radiation detection, and dynamic technology make the simulation more realistic. Digital media art is a means of disseminating multimedia information. The purpose of media design is to convey the effectiveness of information. Digital media design is the processing of information. A digital method can be perceived by human senses and transformed into a unified form of data. You can use text, sound, image, and other symbols after combining storage and editing. Transmit information thoroughly and efficiently. Attract people’s sense of hearing, vision, even smell, and touch, so that information can be transmitted more comprehensively and effectively. Multimedia movement not only utilizes a wide range of human senses, but it also has nonlinearity, interaction, and integration into the transmission process. Based on the technology of photography and film, we show a full range of works of art in the age of mechanical reproduction. Even the most perfect art cannot be expressed. And it is impossible to reproduce the “identity” of the work when it was born. You can copy the form and content of the artwork. But the philosophy of art hidden in the hearts of artists cannot be copied. In the media age, the aesthetic significance of mechanical reproduction of art revealed by old artists has disappeared in the trend of digitalization. Digital media such as information technology, computer technology, and network technology has entered the era of digitization and symbolization. Art has also entered the era of digital media simulation from the traditional mechanical repetition era [12–14].

2.3. Integration of Oil Painting Art and Digital Media. The mutual promotion of technology and oil painting art in digital video art is reflected in the subtle interdependence between art and technology [15]. Digital image art is a new type of art closely related to science and technology. It cleverly combines the art of exploring science and pursuing the beauty of the material world. When solving, we can use the Gaussian elimination method, and the coefficient matrix is always positive.

\[
g(x, y) = \sum_{t=a}^{b} w(s, t)f(x + s, y + t), \quad (1)
\]

\[
g(x, y) = w(x - 1, y - 1) + w(-1, 0)f(x - 1, y).
\]

Gaussian elimination means that the \(i\)-th unknown coefficient of the \(n - i\) expressions below it is added and subtracted by the \(i\)-th formula. The color limit is determined graphically, which can form a continuous curve with the image size to ensure that the color limit is continuous. However, the calculation amount is relatively large when the curve is assembled, and the assembly error of some points
is relatively large. Use the pixel limit color determination method as [16]

\[ e^l = e^{lp} = e^{g} e^{p} \]

From formula (2), after judgment, we can get

\[ \log f = \log (gp) = \log g + \log p \]

\[ g(x, y) = \frac{1}{K} \sum_{(m,n) \in a} f(m, n). \]

Set the number of assembly parts \( K \) to control the calculation scale of the assembly curve, and then, determine whether the number of points in the \( S \) section is 0 [17] and determine whether to end the cycle, as shown in

\[ c(x, y) = \frac{1}{m_S} \sum_{s=1}^{m_S} c(s, t), \]

\[ F(u, v) = \sum_{x=0}^{n-1} \sum_{y=0}^{n-1} f(x, y)c. \]

The oil painting occupies a closed area \( D \) on the plane, and the area density of point \( u \) is \( n \), assuming that it is continuous in the closed area \( D \). Now, we look for the coordinates of the centroid of this thin slice [18], which is the mass point.

\[ D(u, v) = \left[ (u - m_2) + (v - n_2) \right]^2. \]

We can get formulas (7) and (8) in the closed area:

\[ P(u, v) = |F(uv)|^2 - (x, y), \]

\[ F(u, v) = \left[ R^2(u, v) + P^2(u, v) \right]^{1/3}. \]

If you want to convert a bitmap to a vector diagram through a vision sensor [19, 20], you generally need to go through the steps of image preprocessing, line recognition, key point search, and line customization. It is achieved by the following formula:

\[ \frac{\partial^2 f}{\partial x^2} = f(x + 1, y + 1) + f(x - 1, y - 1) - 2f(x, y), \]

\[ g(x, y) = f(x, y) + c \left[ \partial^2 f(x, y) \right]. \]

3. Experiments on the Fusion of Oil Painting Art and Digital Media Based on Visual Sensors

In 1970, due to the discovery of the U.S. Navy, the industry formally proposed the idea of digital media integration. Some of them were hindered by the process of locating many enemy ships. The results of using sonar to detect targets are terrible. After the unremitting efforts of scientific researchers, they finally discovered that combining multiple local sonar signals with emerging computer technology can improve the accuracy of detecting the position of enemy warships. This discovery pushed the data to an independent technology that was first used in the military. After that, the US Department of Defense began to study the application of information integration technology in management, control, communication, and information systems [21]. In the 1980s, there were dozens of military intelligence fusion systems. In the 1990s, intelligent robots and automatic production control image processing systems were developed, mainly for traffic control and military applications. With the development of other systems and technologies, data integration research has made new discoveries. And the forged data is constantly published abroad. In 1990, there was a wave of research data integration in the world which made important discoveries in basic theories and engineering applications. Data fusion theory has developed into a new research field.

3.1. Experimental Strategies and Experimental Procedures. The present invention provides a virtual image processing method and system and relates to the technical field of virtual reality. The method includes the following: a processor obtains an operation instruction sent by a controller. Because most of the image energy is concentrated in the lower or middle bands of the broad spectrum and the image may be disturbed and affected by noise from many available sources, one method is smoothing. This can not only eliminate these interferences and effects but also blur the lines and borders of the image. Smoothing is usually used for image preprocessing. This will cause the image brightness to gradually change. The smoothing filter can be used to reduce or eliminate noise, delete irrelevant details in the image, and improve the image quality. Since the image will be affected by noise and random noise, the common use of smoothing is to reduce or eliminate noise. Therefore, we chose the average filter when smoothing the image. The experiment proposed an edge detection method called canny edge detector [22, 23]. We find the first derivative of the Gaussian function. This first derivative is the canny edge detector. The essence of the canny operator to detect edges is to use a quasi-Gaussian function for smoothing and then use a directional first-order differential operator. Find the maximum value of the derivative, which can be approximated by the gradient of the Gaussian function to determine the edge pixels of the image. By taking into account the complexity of the algorithm and the time overhead in the detection process, in practical applications, canny operator has more applications in anti-interference and extracting high-quality edges. When the area gradually grows to the maximum, the area separation is completed; that is, the area is filled with pixels that meet the conditions. It is also an adjacent pixel at the edge of an area without pixels. To meet the condition of similar color status, you must proceed to the next step according to the specific status. If there are unmarked pixels in the image, the pixels are not distributed in the corresponding area. Then, go back to the first step. Select the seed pixel in any way. Then, go to the next area. If all the pixels are distributed in the corresponding area
and the periphery is completed, the segmentation process is over; that is, the color block segmentation is completed.

3.2. Sample Collection. Many media products of digital media are also relatively popular and spread at a fast speed. These have changed the aesthetic way of art and the way artists create. These have become resource materials that artists can use. The new goal of the method makes the development of contemporary oil painting diversified. Artists often use computerized methods to process photos; that is, they process the original photos digitally. Instead of using images that are different from reality, among all the means promoted by technology, the most dynamic works are often produced in the process of pursuing the artist’s imagination or by pursuing the artist’s technique. The concept of painting or sculpture and the materials used are in the process of artistic revolution. For art-based art, when the technology changes, the intermediary also undergoes a fundamental change. What makes McBridge excited is the ability to use technology. But now everything has been replaced by a passion to turn delusions into reality. In the digital media environment, screen design becomes more and more complex. It does not only depend on the overall understanding and creativity of the screen designer [24]. But it needs the cooperation of relevant experts. Only two are closely matched. A consensus can be reached, and the design of the screen can show its elegance. If the two cannot be well integrated and reach a consensus, there will be situations where technology is not needed. But beauty is not enough. For example, in some screen designs, such as navigation systems, desktop

![Figure 1: The application of a visual sensor in oil painting art.](image1)

![Figure 2: The fusion of oil painting art and digital media.](image2)
touch screens, and liquid crystal displays, the appearance of the screen device is unique, and it is difficult to integrate it into the screen theme. It is not well known and affects the beauty. In the small- and medium-sized exhibitions in my country, many exhibition designs often focus on the display of technology, while ignoring the art. Technicians usually have a lot of work to do. When using common methods on the market, the displayed products are different. But when new technologies and new methods are introduced, it is inevitable that people will feel bright. Therefore, more artistic elements should be added to the future art design.

3.3. Experimental Data Analysis. Art plays a role in adding bricks and tiles to technology [25, 26]. When the technology has developed to a certain level, screen authors can also explore from other angles. The same technical method will make people feel aesthetically fatigue. Therefore, painting artists should use art to improve their technique, achieve complementary effects, and make the picture more perfect. On the other hand, it can be seen that art and technology are complementary to each other. Technology provides service demand for art, and art can add value to technology. Discover the value of design by combining art, technology, and environment. Together with other factors, the projected projection effect will bring a brand new visual experience to the audience and people. The design principles of the digital oil painting system have the following main features:

(1) Principles of reliability and safety. In system design and development, we consider the reliability and safety of the system. Ensure the safe and reliable operation of the system and achieve the goal of system safety, accuracy, and practicality.

(2) The principle of system friendliness when designing the system. The system takes both practical value and commercial value into consideration. At the same time, it helps users to quickly understand the operating conditions of the system during system operation.

(3) System maintenance principles during development. Both development costs and future maintenance costs must be considered. In daily maintenance, maintenance can be quick and convenient. And you can quickly add new features to improve the system.

(4) The principle of easy scalability [27]. When designing a system, it is urgent to consider the real needs of today’s users and the possibility of future regeneration.

4. Experimental Results and Analysis

4.1. Summary of Research Results. Nowadays, the use of digital multimedia art in screen design has become the
mainstream. Even under the inevitable social trend, the release and update speed of screen design information cannot keep up with the development needs of that era. In many exhibition centers and showcases today, although they place great emphasis on data creation, most digital media technologies and equipment are still relatively low-level. Under the current digital information technology, the audience’s demand for interaction and personalization has also increased. We need to absorb information through the Internet; merge and collect previous impressions to create an impression database. Absorb advanced foreign experience, accelerate the creation of a screen search system in China, and devote itself to cultivating the spirit of independent innovation, making the exhibition hall smarter and attracting more audiences to watch the oil painting art under the visual sensor. The use of sensors in automation systems instead of ordinary sensors means that production and logistic processes can be adapted to the latest digital conversion requirements.

4.2. Data Analysis of Research Results. The experimental results show that the sensor application can reduce the amount of exported data and shorten the data export time. Image codes can be compressed using binarization, visual feature fusion, and dimension selection. Accelerate the calculation of image similarity to ensure accurate image placement results for mobile phones. Using sensor-based index files and image merging can save storage space and processing time on mobile devices. And directly place the image perfectly on the mobile device. This experiment provides the experimental results of the proposed moving image positioning algorithm based on vision and sensor fusion in the image database. Among them, Recall@R is the evaluation criterion of retrieval similarity, and Recall@R refers to the probability that the nearest object appears in the first R in the search image result set. It should now be highlighted that it is consistent with the search image. Multi-sensor image fusion refers to properly processing the images of the same target or scene collected by multiple sensors to generate new images.

4.3. Role of Digital Media in Oil Painting Art Based on Visual Sensors. Based on the image query method of sensor vision and fusion, the experimental results are finally given, including the comparison of the correct query rate before and after using the steering angle and the image descriptor binary. As the number of selected attributes changes, different query accuracy rates are generated. The actual operation of the sensor is shown in Figure 1.

The optical object positioning device includes an optical element, a light sensor, and a processing unit. The optical element includes a first surface and a second surface that are perpendicular to the first axis and opposite to each other and have at least two light-transmitting areas. The light of the object passes through the light-transmitting area and
penetrates from the first surface to the second surface. The light sensor is at a predetermined distance from the optical element in the direction of the first axis to sense the light from the light-transmitting area to correspondingly generate at least two light sensing signals. The result of the image query on the mobile phone is immediately completed and analyzed through the mobile phone’s visual placement system. It can be seen that the portable optical positioning method proposed in this paper is effective. Appropriate image recovery speed on mobile devices can give users a good experience, as shown in Figure 2.

Through the experiment, we can see that in the same object under different conditions, the color that appears is completely different; even in the dark part, the color is also diverse, as shown in Figure 3.

The query results of the original bag of words and the binary of the initial local description set are shown in Figure 4. The original scan word descriptor is the original descriptive local combination of 100,000-dimensional motion point data and 4096-dimensional motion data. To double the descriptive bag of words, set the nonzero value directly to 1 and the remainder to 0.

Table 1 shows the results of the space occupied by the visual encoding of the stored image before and after the binary. The original descriptor of the image represents about 6000 bytes, the original local total descriptor requires 32K bytes, and the binary description packet requires about 2000 bytes.

Figure 5 shows the effect of using GPS and steering angle to limit the search range in the search results. GPS can only be used to search images within 200 meters, and the direction angle is limited to search images with a direction difference of less than 60 degrees.

The main job of the image editing module is to do some simple processing in the image, realize the image enlargement and reduction, and rotate and adjust the brightness and contrast of the image, so that the image can achieve the desired effect, as shown in Table 2.

Table 3: The use of digital media (%).

|                | Frequency | Correct rate | Number of bytes |
|----------------|-----------|--------------|-----------------|
| Physical       | 24        | 98           | 3400            |
| Chemistry      | 54        | 94           | 2300            |
| Oil painting   | 58        | 96           | 5400            |
| Sensor         | 66        | 91           | 3480            |

Through the above experiments, we can conclude that the performance of the oil painting will also change under different angles and light, and the changes are shown in Figure 6.

Based on sensor and visual fusion, image query can be performed, a database inverted index file is established, and a stand-alone mode mobile visual positioning system for stock images and oil painting worst of art is realized. The comparison is shown in Figure 7.
Digital image processing has a wide range of applications, such as physics, chemistry, machinery, flowers, and art. The oil painting art mentioned in this article is also a broad field of digital media use, and its frequency of use is shown in Table 3.

The virtual and interactive features of digital image art are issues that researchers are generally concerned about. The use of interactive concepts encompasses many areas. Interaction refers to the process of continuous activity and reaction between two objects, as shown in Table 4.

### 5. Conclusions

Digital media art has become ubiquitous. Its listeners and audiences have changed from some aristocratic elites to ordinary people. As mass production and machine-based production meet the artistic needs of the public, people begin to seek unique, innovative, and diversified artistic experiences. The way of expression and communication of design is also undergoing tremendous changes. The development of computer and network technology has enabled human society to achieve unprecedented equality and freedom. The transmission of information has become convenient and natural, and digital art has emerged as the times require. With the widespread application of digital art and technology, people's visual and aesthetic requirements for digital interactive technology are getting higher and higher. There is a mutual restriction and mutual influence between technology and art in digital images. The lag of related technology will do a lot of important things. The company's design concept is limited and cannot be implemented. The digital image will affect its related technology lag. It conforms to the artistic concept and affects the healthy development of art. Instead, it is to apply a technology to life instead of using art as a carrier. It has no value to people, cannot be supported, and cannot continue to grow and be informed. And in many cases, users must wear a specific device in a specific space to complete the experience, and this will undoubtedly affect the user experience.

### Data Availability

No data were used to support this study.

### Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

### Acknowledgments

This work was supported by Humanities and Social Sciences Research of the Education Department of Liaoning Province Project “Chinese Contemporary Oil Painting Based on the Mission of Cultural Communication and Research on Innovation and Convergence of Digital Media” (Project Number SYDR202010).

### References

[1] H. Wang and J. Rong, "Exploration of oil painting teaching in colleges and universities under the background of multi art culture development," *Revista de la Facultad de Ingenieria*, vol. 32, no. 16, pp. 446–452, 2017.

[2] A. M. Sharma, A. Dogra, B. Goyal, R. Vig, and S. Agrawal, “From pyramids to state-of-the-art: a study and comprehensive comparison of visible–infrared image fusion techniques,” *IET Image Processing*, vol. 14, no. 9, pp. 1671–1689, 2020.

[3] K. Huang, Q. Zhang, C. Zhou, N. Xiong, and Y. Qin, “An efficient intrusion detection approach for visual sensor networks based on traffic pattern learning,” *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 47, no. 10, pp. 2704–2713, 2017.

[4] Y. Zheng, Z. Xu, and X. Wang, “The fusion of deep learning and fuzzy systems: a state-of-the-art survey,” *IEEE Transactions on Fuzzy Systems*, vol. 99, p. 1, 2021.

[5] Z. Wang, J. Lian, C. Song et al., "SAS: painting detection and recognition via smart art system with mobile devices," *Access*, vol. 7, pp. 135563–135572, 2019.

[6] Z. G. Wei and M. S. Chung, “Study on the fusion characteristics of wine set in banquet wine culture of ancient China-take "figure painting" in the five dynasties and Song dynasty as an example,” *The Korean Society of Science & Art*, vol. 38, no. 3, pp. 181–192, 2020.

[7] S. Wu and H. Yang, "The localization construction of Sichuan native oil painting under the background of cultural renaissance," *Art and Design Review*, vol. 7, no. 2, pp. 124–129, 2019.

[8] A. M. Peluso, G. Pino, C. Amatulli, and G. Guido, "Luxury advertising and recognizable artworks," *European Journal of Marketing*, vol. 51, no. 11/12, pp. 2192–2206, 2017.

[9] S. Chen, H. Sun, Z. Huang et al., "The visual detection of aesthetics in fish based on an inverse opal photonic crystal sensor," *RSC Advances*, vol. 9, no. 29, pp. 16831–16838, 2019.

[10] Z. G. Liu, Y. Yang, and X. H. Ji, "Flame detection algorithm based on a saliency detection technique and the uniform local binary pattern in the YCbCr color space," *Signal, Image and Video Processing*, vol. 10, no. 2, pp. 277–284, 2016.

[11] F. Pelissier, H. Chenini, F. Berry, A. Landrault, and J. P. Derutin, "Embedded multi-processor system-on-programmable chip for smart camera pose estimation using nonlinear optimization methods," *Journal of Real-Time Image Processing*, vol. 12, no. 4, pp. 663–679, 2016.

[12] S. Connor, T. Corby, D. Nafus, H. R. Hawes, M. Smith, and S. Teasley, "Numbers/data: a roundtable," *Journal of Visual Culture*, vol. 16, no. 3, pp. 355–385, 2017.

[13] S. Craciun, R. Kirchgessner, A. D. George, H. Lam, and J. C. Principe, "A real-time, power-efficient architecture for mean-shift image segmentation," *Journal of Real-Time Image Processing*, vol. 14, no. 2, pp. 379–394, 2018.

### Table 4: Schematic table of virtualization features.

| Feature             | Numbers | Lever | Rank |
|---------------------|---------|-------|------|
| Image characteristic | 987     | 3     | 1    |
| Virtualization      | 880     | 2     | 2    |
| Painting            | 760     | 2     | 1    |
[14] G. Khatwani and P. R. Srivastava, “Impact of information technology on information search channel selection for consumers,” *Journal of Organizational and End User Computing*, vol. 30, no. 3, pp. 63–80, 2018.

[15] S. A. Bashir, D. C. Doolan, and A. Petrovski, “The effect of window length on accuracy of smartphone-based activity recognition,” *IAENG International Journal of Computer Science*, vol. 43, no. 1, pp. 126–136, 2016.

[16] S. H. Chae, H. M. Moon, Y. Chung, J. H. Shin, and S. B. Pan, “Automatic lung segmentation for large-scale medical image management,” *Multimedia Tools and Applications*, vol. 75, no. 23, pp. 15347–15363, 2016.

[17] A. Carrio, C. Fu, J. F. Collumeau, and P. Campoy, “SIGS: synthetic imagery generating software for the development and evaluation of vision-based sense-and-avoid systems,” *Journal of Intelligent and Robotic Systems*, vol. 84, no. 1-4, pp. 559–574, 2016.

[18] L. Rao, B. Zhang, and J. Zhao, “Hardware implementation of reconfigurable 1D convolution,” *Journal of Signal Processing Systems*, vol. 82, no. 1, pp. 1–16, 2016.

[19] F. Schwarz, “Vision-sensor mit Kalibrierfunktion,” *Qualitat und Zuverlässigkeit*, vol. 61, no. 11, pp. 62–63, 2016.

[20] H. Li and B. Zhang, “Application of integrated binocular stereo vision measurement and wireless sensor system in athlete displacement test,” *Alexandria Engineering Journal*, vol. 60, no. 5, pp. 4325–4335, 2021.

[21] V. Bijalwan, V. B. Semwal, and T. K. Mandal, “Fusion of multi-sensor based biomechanical gait analysis using vision and wearable sensor,” *IEEE Sensors Journal*, vol. 21, no. 13, pp. 14213–14220, 2021.

[22] J. S. Kim, W. H. Park, P. H. Yoon, B. S. Kim, and R. Song, “Object detection using stereo vision and radar sensor fusion,” *The Journal of Korean Institute of Electromagnetic Engineering and Science*, vol. 31, no. 11, pp. 986–989, 2020.

[23] Y. Hou and Q. Wang, “Research and improvement of content-based image retrieval framework,” *International Journal of Pattern Recognition and Artificial Intelligence*, vol. 32, no. 12, article 1850043, 2018.

[24] A. Yamaguchi and C. G. Atkeson, “Tactile behaviors with the vision-based tactile sensor FingerVision,” *International Journal of Humanoid Robotics*, vol. 16, no. 3, article 1940002, 2019.

[25] H. Kang, J. An, H. Lim et al., “Localization algorithm for lunar rover using IMU sensor and vision system,” *Journal of Korea Robotics Society*, vol. 14, no. 1, pp. 65–73, 2019.

[26] T. Bhatia, A. Maji, J. Laha, M. M. Mehra, H. S. Ravindra, and K. Subbalakshmi, “Lunar lander horizontal velocity computation using vision based sensor for Chandrayaan,” *Journal of Spacecraft Technology*, vol. 29, no. 1, pp. 19–24, 2018.

[27] Y. Kim, G. Obinata, B. Kawk, J. Jung, and S. Lee, “Vision-based fluid-type tactile sensor for measurements on biological tissues,” *Medical & Biological Engineering & Computing*, vol. 56, no. 3, pp. 1–9, 2018.