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Dynamic Visual Effect Optimization of New Media Art Under the Integration of Visual Perception and Deep Learning

Qiaqia Wang[1] and Xiheng Yue[2]

[1]School of Fine Arts, Zhengzhou Normal University, Zhengzhou, Henan 450044, China, wangqiaqia@zznu.edu.cn
[2]School of IoT, Henan Institute of Economics and Trade, Zhengzhou, Henan 450046, China, xihengyue@gmail.com

Corresponding author: Qiaqia Wang, wangqiaqia@zznu.edu.cn

Abstract. In today's digital and information age, new media art, as a new art form, is attracting more and more audiences with its unique charm. The integration of computer-aided design (CAD) and deep learning (DL) will surely breathe fresh life into the evolution of new media art. This article employs cutting-edge image processing technology and novel algorithm designs to enhance conventional dynamic visuals. We achieve this by incorporating image feature point detection to refine point cloud data registration, implementing a spatial bounding box to bolster matching point search efficiency, and refining image specifics and colour representation via categorical contrast adjustments and adaptive brightness corrections. Our findings reveal that, in contrast to traditional techniques, the optimized algorithm introduced here demonstrates superior efficiency and impact in object reconstruction and image enhancement, thereby notably elevating the visual appeal of new media artworks. The extensive applicability and practicability of the optimization algorithm are verified through comparative experiments and tests in different scenarios.

Keywords: New Media Art; Cad Technology; Deep Learning; Dynamic Visual Effect; Optimization Algorithm
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1 INTRODUCTION

In the 21st century, with the popularization of electronic computers and technology, mankind has entered the information age driven by new media [1]. The decoder of the image strategy integrates the sampled images with each other, achieving a precise grasp of dynamic artworks. Their proposal not only accepts input images and their foreground masks but also outputs segmented images with accurately segmented foreground regions. In new media art, the processing of time information is particularly important. To understand the digital transformation brought about by digital media art in the era of artificial intelligence and to explore the characteristics and future development of digital media art [2]. Through academic research, clarify the concepts of digital media and digital media art and understand the relationship between digital media technology and artificial intelligence. From the perspective of technology, communication, and art, observe the current manifestation of digital media art at the increasingly intelligent level, and identify the hidden problems and response methods under the wave of intelligence. Reflecting on innovative development strategies for digital media art, analyzing the digital media industry, and conducting relevant talent cultivation thinking on the new talent demand brought about by the growth. Have a clear concept of digital media technology and a general understanding of the application scenarios of digital media technology in the era of intelligence. Observing the response strategies of digital media art education in universities under the influence of the expansion of the digital media industry. Finally, observe, summarize, and imagine the innovative practices in the current and even future post-artificial intelligence era. Think about digital media art education in Chinese universities and understand the relevant policies of the country to support the development of digital media art [3]. Their proposal optimizes the watermark grayscale. [4]. Artists can use these technologies to create more diverse, complex, and interactive artworks, thereby meeting the diverse needs of audiences for artworks. In the practice of new media art, computer-aided art design technology provides artists with efficient, comprehensive, and all-round new technological means. Meanwhile, new media art will be applied and promoted in more fields, contributing more strength to the cultural development and inheritance of human society. The development of new media art cannot be separated from the advancement of computer-aided art design technology [5]. Looking ahead to the future, new media art will continue to deeply integrate with science and technology, promoting innovation and development in artistic creation.

As a unique art form that merges technology with creativity, new media art has garnered increasing attention and admiration. Research has found that digital media art is the crystallization of technology and art in the wave of digital informatization, which confirms the development process of the integration and mutual promotion of multimedia and new art forms [6]. The application in the era of artificial intelligence is rich and diverse, but there are also problems such as weak copyright awareness, the prevalence of parody culture, and the lack of cultural connotations in the wave of intelligence. When facing and engaging in online behaviour, one should consider and be wary of excessive entertainment to prevent irreversible negative impacts [7]. Therefore, application-oriented with innovative abilities, are the driving forces that the digital media art industry is currently seeking. For example, the replicability, combinability, computability, and transferability that come with digital technology, the interactivity, immersion, virtuality, and intelligence of social communication processes, the diversity of artistic forms, the nonlinearity of artistic narratives, the real-time nature of information transmission, and the convenience of creative tools. It carries the characteristics of many disciplines. Based on the above findings, the author believes that we can learn from the talent cultivation models of foreign universities, summarize their advantages, and learn from their advanced talent cultivation. In addition, the development of digital media art cannot be separated from creativity [8]. The talent required by the digital creative industry is a comprehensive literacy that combines technical, creative, and operational capabilities. Further improve the training methods for digital media art talents in domestic universities, and find a path for cultivating digital media art talents that is suitable for the era of artificial intelligence.

In today's pursuit of urban quality of life and increasing public participation, the interaction between the public and landscape installations has become particularly important. In order to break the traditional one-way display mode of landscape installations and establish a more interesting and in-depth connection between the public and landscape installations, we need to break away from the traditional thinking framework and rethink the way urban public space landscape installations interact with the public. The rapid development of intelligent technology has provided us with new ways to achieve this goal. The experiential interactive media landscape device based on intelligent technology can not only inject new vitality into urban public spaces but also attract public participation and experience through innovative ways [9]. These devices can utilize advanced technologies such as sensors, big data, and artificial intelligence to perceive the surrounding environment and public behaviour and make corresponding feedback accordingly, thereby achieving real-time interaction with the public. Interactive media landscape installations can play a unique role in different types of urban public spaces and different spatial themes. For example, in parks and green spaces, interactive devices that combine with the natural environment can be installed, allowing the public to experience the charm of technology while enjoying the natural scenery. Technology with urban public spaces for research, and analyzes and summarizes domestic and foreign case studies. According to the design process and technical implementation approach, carry out the design practice of interactive media landscape devices intervening in urban public spaces, and achieve the landing of the devices. And summarize the significance of the intervention plan in the base, providing a certain reference for the rational application of experiential interactive media landscape devices based on intelligent technology in urban public spaces in the future. Finally, the theoretical research results will be tested through practice, and the Xuzhou Huilongwo Historical and Cultural District will be used as the design base. The watermark information can be embedded into the DCT coefficients, which can embed almost invisible watermark information without compromising the original image quality [10]. New media art, renowned for its interactivity, multidimensionality, and immersiveness, offers viewers an unprecedented visual treat and contemplative space. By amalgamating DL algorithms with CAD technology, we can maximize their collective strengths to elevate new media art's visuals. The primary innovations introduced in this study include:

(1) This research combines the precise design ability of CAD with the image processing ability of DL and applies it to the dynamic visual effect optimization of new media art.

(2) The traditional dynamic visual effect optimization mainly depends on the artist's manual adjustment and empirical judgment. In this study, the dynamic visual effect is automatically learned and optimized through DL technology.

(3) This study not only innovates on the technical level but also tries to promote the deep integration of art and technology. By introducing DL technology, the artistic creation process is more intelligent, and more possibilities are provided for artists.

Initially, this article elucidates the significance of new media art and explores the potential applications of CAD and DL technology within this domain. Subsequently, it delves into the fundamental principles of CAD and DL, assessing their suitability for new media art. Following this, experiments are conducted to validate the tangible impact of integrating CAD and DL on enhancing the dynamic visuals of new media art. In conclusion, the study's findings are summarized, and potential future directions for technological advancement are outlined.

2 RELATED WORK

Nowadays, intelligent algorithms have expanded the boundaries and possibilities of new media art. This new creative approach greatly enriches the expressive techniques and forms of new media. In the virtual world, artists can break through the limitations of the real world, Ornes [10] created stunning scenes and effects that are difficult to achieve in real life. In addition, the collaborative creation mode in the virtual world allows artists to cross geographical boundaries, share ideas and ideas in real time, and create more diverse and innovative artworks through online collaboration tools or multiplayer interaction functions. Some scholars have conducted in-depth analysis of the progress of computer digital media research, Pallasena et al. [11] explored collaboration in virtual environments. Considering the topological similarity between artworks, extracting parameters from real images to achieve realistic 3D parametric modelling of artworks is of great practical significance. Taking interactive media landscape installations as the research object, by selecting expression media and interactive experience methods, design the most suitable interactive media landscape installations for specific urban public spaces. The media landscape studied in this article belongs to the second category of media landscapes, which are artworks in modern urban spaces such as sculptures, landscape walls, and structures. Media landscapes are implanted with intelligent technology as material carriers. In short, interactive media landscape installations are interactive installation works with media landscape characteristics. The installation art that interacts with people not only has the function of information dissemination but also is a part of the urban landscape, playing a role in beautifying the urban spatial environment. The exchange with traditional Shu only and the exchange between people and scenery stimulates the interaction between the public and the public, promotes communication between people and the scenery, stimulates the vitality of the place, and creates a positive spatial atmosphere.

Rarenko [13] clarified the concepts of digital media and digital media art through academic research by domestic and foreign scholars and understood the relationship between digital media technology and artificial intelligence. Reflecting on innovative development strategies for digital media art, analyzing the digital media industry, and conducting relevant talent cultivation thinking on the new talent demand brought about by the growth and development of the digital media industry. Then, from the perspectives of technology, communication, and art, observe the current performance of digital media art at the increasingly intelligent level, and identify the hidden problems and response methods under the wave of intelligence. Finally, observe, summarize, and imagine the innovative practices in the current and even future post-artificial intelligence era. Further, understand the current research status of digital media art and establish a preliminary understanding of digital media art. Talent cultivation in domestic and foreign universities can help to gain a comprehensive understanding of the talent cultivation model for digital media art. Search for research literature related to digital media art, summarize the points needed from numerous literature materials, and learn from previous research methods and ideas. And understanding the relevant policy content of the country to support the development of digital media art. Distinguishing confusing concepts. By collecting literature, we aim to understand artificial intelligence, gain insight into digital media art and its connotations, and gain an overview of the digital media industry at home and abroad. Have a clear concept of digital media technology and a general understanding of the application scenarios of digital media technology in the era of intelligence. The application of these algorithms enables artists to more accurately control the visual effects and artistic value of their works during the creative process, thereby creating more innovative and unique works. When it comes to the application of this technology, we can easily see that it has brought profound impacts to the design field. Firstly, from the perspective of accuracy and efficiency, the introduction of this technology has greatly improved the quality of work for designers. Traditional design methods are often limited by manual operations or the limitations of traditional software, making it difficult to achieve precise design requirements. Now, with the widespread application of this technology, designers can more easily complete high-precision work, while greatly shortening the design cycle and improving overall work efficiency. Secondly, this technology also provides new tools and means for artists in the creative process. Traditional art creation often relies on physical materials such as brushes and pigments, while this technology provides artists with a broader creative space through digital means. Artists can use these tools to present their creativity and ideas more intuitively, breaking the limitations of traditional art creation. More importantly, this technology enables artists to explore more innovative artistic styles and forms of expression by changing, combining, and optimizing the shape of their artwork. In the past, artists often had to repeatedly try and modify physical materials, which was cumbersome and time-consuming. Now, through this technology, artists can quickly try and modify in virtual environments, thereby more efficiently exploring new art styles and forms of expression. This not only provides artists with more creative inspiration but also injects new vitality and creativity into the field of new media art.

In the vast field of new media art, three-dimensional advertising graphic design is gradually emerging, injecting new vitality into brand communication with its unique visual expression and interactivity. Constructing a visual brand communication classification for 3D graphics not only helps us systematically understand the role of graphics in brand communication but also provides designers with clearer design guidance. Through precise modelling and rendering, Song [14] can present the characteristics and advantages of products to the audience in a more intuitive and realistic way, greatly enhancing the visual effect of advertising and attracting the audience's attention. The application of 3D animated graphics in television advertising undoubtedly adds liveliness and fun to the dissemination of brand information. This innovative advertising form not only improves the dissemination effect of advertising but also brings higher brand awareness and favorability. This immersive experience strengthens its audience, helping to enhance brand loyalty and influence. By creating virtual reality scenes, audiences can immerse themselves in the brand's world and engage in deeper interactions with the brand. The brand's uniqueness and personalization are highlighted, making it stand out among numerous competitors. The combination of new media art animation 3D graphics and virtual reality technology has brought unprecedented opportunities for brand communication. In addition, the application of new media art three-dimensional graphics in visual brand communication can also present brand characteristics and styles in a visual way. Meanwhile, with the continuous advancement of technology and the expansion of applications, 3D advertising graphic design will play an increasingly important role in brand communication, making more contributions to the enhancement of brand value. This visual brand presentation not only enhances brand awareness but also enhances the visual influence of the brand, helping to enhance its value and image. Wang and Hu [15] continuously explore new design concepts and technical means to create more exciting and engaging advertising works. Driven by new media art, 3D advertising graphic design is developing towards greater diversity, personalization, and interactivity.

3 THEORETICAL BASIS

3.1 Visual Perception Theory

Visual perception is the main way for human beings to obtain external information, which involves light, colour, shape, movement and many other aspects. In the new media art, the optimization of dynamic visual effects must first conform to the laws of human visual perception.

Colour is an important element in human visual perception, and different colours can trigger different emotional reactions. In the new media art, rational use of the principles of colour contrast and colour matching can effectively enhance the visual impact of works.

Shape is another key factor in visual perception. Complex shapes can arouse the curiosity of the audience, while simple shapes are easier to be recognized and remembered by the audience. In the new media art, we can create a variety of visual effects by skillfully using the changes and combinations of shapes.

The moving elements in dynamic visual effects are very important to attract the audience's attention and convey emotions and information. According to the research of Gestalt Psychology, people have a natural concern for moving objects. Therefore, in new media art, the rational use of animation principles to design the trajectory, speed and rhythm can significantly enhance the attractiveness of the works.

3.2 GAN

GAN, comprising a generator and a discriminator, produces realistic images or videos through their adversarial training. In new media art, GAN facilitates the creation of artistic images and dynamic scenes, thereby enriching artistic expressions and offering a more immersive experience to viewers.

Models like RNN and LSTM excel in handling sequential data. In the domain of new media art, they aid in predicting future frames of dynamic scenes and generating coherent animations. The judicious application of these technologies significantly enhances dynamic visual effects.

4 OPTIMIZATION OF DYNAMIC VISUAL EFFECTS OF NEW MEDIA ART

The optimization of the dynamic visual effect of new media art is a process of comprehensive application of advanced technology and artistic creativity. In the digital age, new media artists are not only pursuing the perfect presentation of static pictures but also bringing the audience into a multidimensional and immersive artistic experience through dynamic visual effects. The dynamic visual effect is the soul of new media artworks, which can give the vitality and appeal of the work. Through carefully designed dynamic elements, new media works of art can more vividly convey the artist's creative intention and guide the audience's emotional resonance. Dynamic visual effects can also enhance the audience's sense of immersion so that the audience seems to be in the world built by the work, thus gaining a deeper artistic experience.

The calibration process of new media art images, as shown in Figure 1, not only covers technical adjustment and optimization to ensure the visual accuracy and aesthetic feeling of the image but also involves fine adjustment and control of key visual parameters such as colour, brightness and contrast. This process is an indispensable part of new media artistic creation, which ensures the quality of artistic works when they are reproduced in digital high definition and enables the audience to appreciate the complete visual effect that the artist expects to convey.

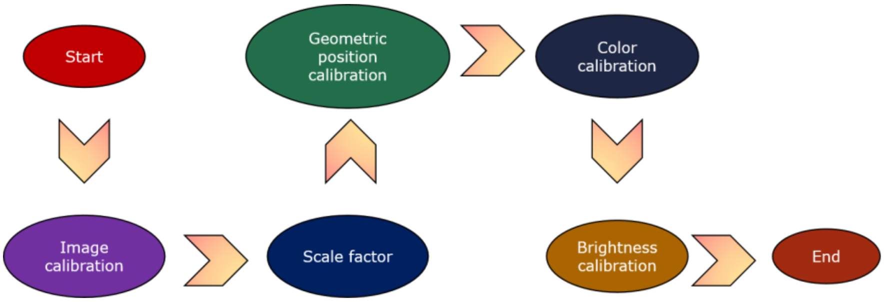

Figure 1: Image calibration process.

The fluency and coherence of dynamic visual effects are important indicators for measuring their quality. In order to improve these two points, this study adopts high frame rate rendering technology to ensure that the picture can remain clear and stable when moving rapidly. Reasonable keyframe setting and animation curve adjustment are also the keys to realising smooth animation. By carefully adjusting the position, speed, and acceleration of each keyframe, a more natural and realistic dynamic effect can be created.

The artistic design associated with new media predominantly pertains to the creative endeavour that employs characters, images, and hues as fundamental components, utilizing visual symbolism to communicate diverse data artistically. This design philosophy extends beyond mere aesthetics, encompassing a dynamic and interactive visual experience that engages the audience. In the pursuit of enhancing these visuals, techniques such as image smoothing become crucial. To mitigate noise interference and improve the overall clarity of the artistic composition, the smoothing function can be convolved with the image function. By applying Gaussian smoothing, new media artists can ensure that their designs maintain visual coherence and impact, elevating the artistic experience for the viewer. Specifically, the Gaussian smoothing function stands as follows:

$$G(x,y,\sigma) = \frac{1}{2\pi\sigma^2}\exp\left(\frac{x^2+y^2}{2\sigma^2}\right) \tag{1}$$

As the adjustable parameter σ is reduced, the accuracy of spatial positioning improves, yet the suppression of high-frequency noise weakens.

To obtain a superior photo group $V(p)$, the filtering process employs the formula below:

$$\left|V^*(p')\right|(1-g^*(p)) < \sum_{p\in U(p)} (1-g^*(p)) \tag{2}$$

Here, $U(p)$ denotes the collection of patches that fail to meet the necessary visible information criteria.

Considering M a solid model, the spatial indicator function used for surface reconstruction assumes the following form:

$$\Phi(p) = \begin{cases} 1, & p \in M \\ 0, & p \notin M \end{cases} \tag{3}$$

Nonetheless, applying this method without modification results in background saturation, causing the subject and background to blend. Consequently, this study introduces a threshold to ensure proper limitation. Hence, during histogram counting, thresholds are assigned to grey pixels for accurate statistics:

$$p\ \alpha_i = \begin{cases} \frac{p}{h} & h_i > p \\ \frac{h_i}{h} & h_i < p \end{cases} \tag{4}$$

The provided formula $p\ \alpha_i$ signifies the probability of i a gray value occurring, whereas h denotes the overall pixel count. Additionally, α_i stands for the background grayscale.

The layering and 3D sense of pictures in new media works of art are very important to improve the dynamic visual effect. In order to achieve this goal, this study uses depth information to distinguish foreground and background elements and enhances the spatial sense of the picture by adjusting the perspective relationship and light-dark contrast of elements. Through the rational use of colour contrast and light and shadow changes, we can create a different atmosphere and emotional expression. For example, in the performance of cheerful and lively scenes, bright and bright colours and rapid light and shadow changes are used to enhance the dynamic of the picture. In the performance of heavy and sad scenes, dim and heavy colors and slow light and shadow changes are used to create a depressing atmosphere.

Drawing inspiration from the natural tendency of human eyes to appreciate art, the image block discriminator has been upgraded to a multi-perception discriminator. This advancement encapsulates not just the general overview but also the scrutiny of pivotal features, thereby aligning more closely with how humans naturally observe artistic creations. Figure 2 shows the Multi-perception discriminator.

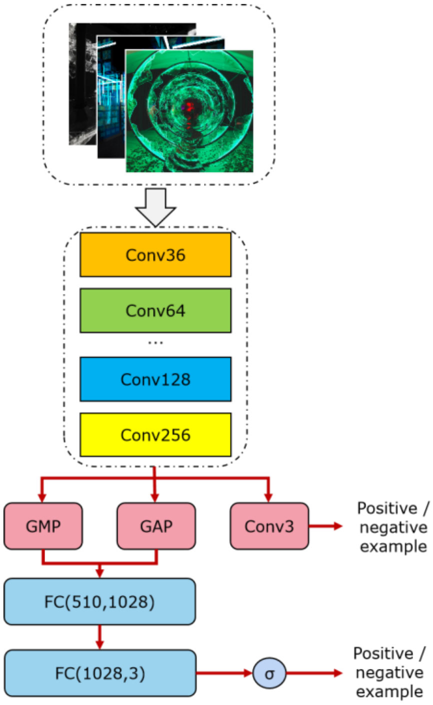

Figure 2: Multi-perception discriminator.

$$f\ R,t\ = \sum_{i=1}^{N} \left\| Q_i - \ RP_i\_T\ \right\|^2 \tag{5}$$

$$\sum{}^2 = \sum_{i=1}^{N} \left\| q_i^{'} - Rq_i \right\|^2 \tag{6}$$

$$I_0\ x,y\ = K_1 \lg\left[K_2 + K_3 I_i\ x,y\ \right] \tag{7}$$

In this context, K_i remains constant, $I_i\ x,y$ serves as the input, and $I_0\ x,y$ represents the output.

The human visual system can be envisioned as a linear framework, allowing for the utilization of the inverse transformation of the MTF function to generate a new function. This guarantees that, upon passing through the human eye, the MTF demonstrates a roughly linear impact, validating its classification as a linear correction function:

$$I_{out}\ x,y\ = \frac{K_1}{K_2 + e^{K_3\ K_4 - I_{in}\ x,y}} \tag{8}$$

In this equation, K_i remains a fixed constant, K_1, K_2 serves as the normalization constant, K_3 adjusts the image contrast, and K_4 modifies the image brightness. $I_{in}\ x,y$ represents the input signal, while $I_{out}\ x,y$ denotes the output signal.

Taking into account the computational complexity and individual preferences for bright hues, the experiment primarily employs exponential stretching:

$$S = \sqrt{a^2 + b^2} \tag{9}$$

$$\bar{S} = S^a \tag{10}$$

S stands for the initial saturation component, $\bar{S}$ denotes the saturation component after transformation, while a, known as the stretching factor.

Within the colour space, histogram statistics are conducted on brightness information. Based on this histogram data, images are categorized as dark, normal, or bright. Depending on the situation, various adjustment functions are then applied for appropriate tuning.

$$\begin{cases} Partial\ darkness, & N_1 > \ M \times N\ \ / 2 \\ Normal, & N_2 > \ M \times N\ \ / 2 \\ Pianliang, & N_3 > \ M \times N\ \ / 2 \\ No\ treatment, & Other \end{cases} \tag{11}$$

Here, N_1, N_2, N_3 represent the respective counts of pixel values that fall into the dark, normal, and bright categories. After conducting numerous experiments, we have chosen the most suitable threshold to distinguish these three scenarios.

In the process of optimizing the dynamic visual effect of new media art, the deep integration of technology and art is the key. Technicians need to fully understand the artist's creative intention and aesthetic needs and provide them with targeted technical support. Artists, on the other hand, need to constantly learn and master new technologies and skillfully integrate them into their own works. By improving the fluency and coherence of the picture, enhancing the layering and 3D sense of the picture, innovating the design and presentation of dynamic elements, and paying attention to the use of colour, light, and shadow, the dynamic visual effect can be significantly improved.

5 EXPERIMENT AND RESULT ANALYSIS

Extracting 3D feature components from images within the target contour area stands as a pivotal technique in enhancing the dynamic visual effects of new media art. Through this extraction, we can more precisely capture the dynamic nuances of artistic works, enabling the identification of artistic motion effects in visual perception. This approach relies not solely on the image's 2D data but also leverages the unique attributes present in 3D space, ensuring more precise and all-encompassing recognition outcomes.

Following the recognition of artistic motion effects, the results, outlined in Table 1, become apparent. As the table illustrates, utilizing the algorithm introduced in this article yields an impressive average recognition rate of 95% for artistic motion effects.

	Characters	*Picture*	*Background*	*Animation*	*Recognition rate (%)*
Characters	9	1	0	0	90
Picture	0	10	0	0	100
Background	0	0	10	1	90
Animation	0	0	0	11	100
Average recognition rate (%)	95%				

Table 1: Algorithm recognition results.

The optimization of dynamic visual effects in new media art not only emphasizes identification accuracy but also prioritizes the audience's artistic experience. Hence, throughout the optimization process, we strive for technological advancements while fully respecting the aesthetic appeal of artworks and the audience's esthetic preferences. This study aims to merge cutting-edge technology with artistic ingenuity, delivering a more captivating and memorable artistic journey for viewers.

To conduct our experiment, we placed the target on the displacement test bench and utilized two cameras to capture its initial position, serving as our reference image. Next, we activated the displacement test bench and recorded the target's image while in motion. For a more comprehensive analysis, we varied the maximum displacements of the target in three dimensions and conducted five sets of experiments, documenting ten images per set. Upon completing the experiments, we shut down the displacement test bench. For detailed experimental outcomes, refer to Figures 3 and 4.

The experimental results indicate that as displacement increases in the X-axis direction, the relative error decreases. This suggests that greater movements along the X-axis enable the measurement system to record these displacements with greater precision. The additional data points provided by larger displacements enhance measurement accuracy. During X-axis movement, displacements also occur in the Y and Z axes.

The results show that in new media art or similar fields, through high-precision image processing and data analysis technology, the precise movement of the target in 3D space can be effectively captured and recorded. This is of great significance to the optimization of dynamic visual effects in new media artworks because it allows artists to control and adjust the dynamic elements in the works more accurately, thus enhancing the visual experience of the audience.

In this section, various models are used to identify the dynamic visual effects in new media art, and the learning rates of all models are consistent. See Table 2 for the identification results.

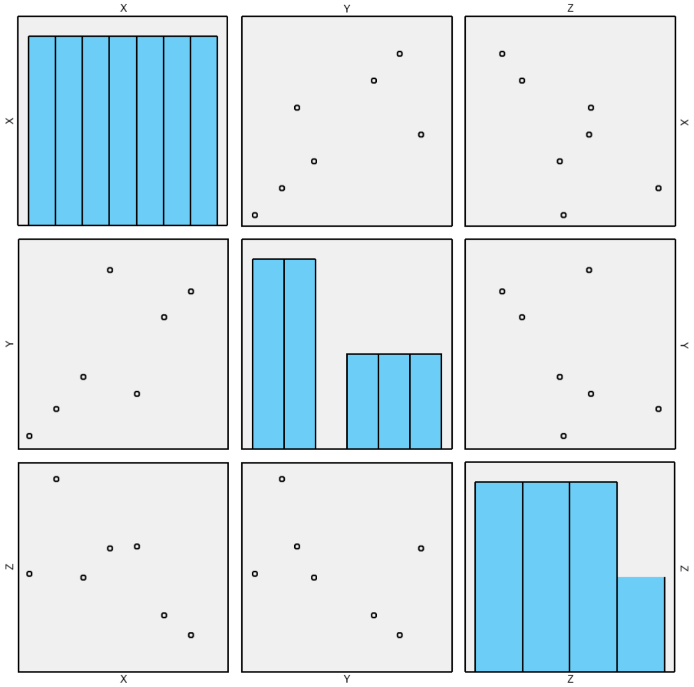

Figure 3: Moving X-axis static test.

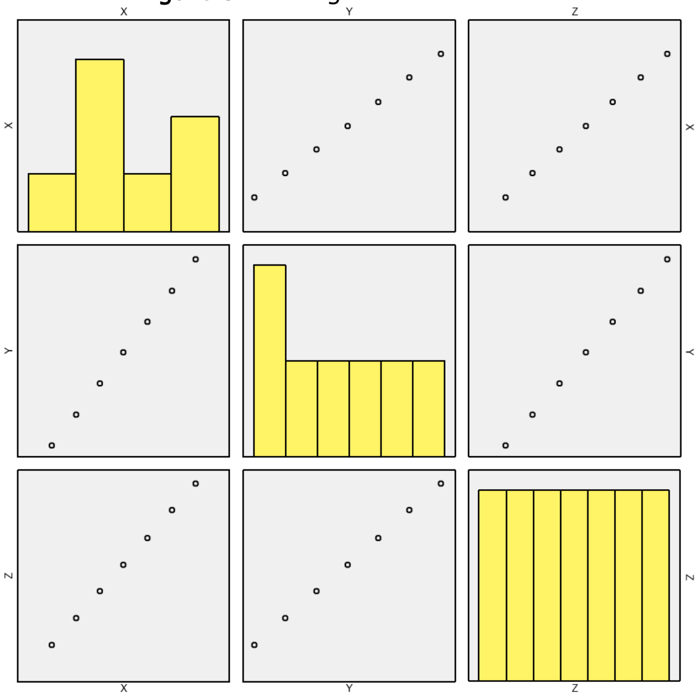

Figure 4: Moving xyz triaxial static test.

Method	*Iterations*	*Training*	*Training*	*Verification*	*Verification*	*Test*

		loss function	*accuracy*	*loss function*	*accuracy*	*accuracy*
AlexNet	82	0.017	0.985	0.221	0.922	0.874
VGG16	68	0.022	0.976	0.004	1	0.963
GoogLeNet	45	0.015	0.989	0.006	0.991	0.995

Table 2: Comparison of results of different models.

AlexNet model's test accuracy stands as the lowest among the models compared. Despite being a renowned DL model widely employed in image recognition, it appears to lack the capability to capture and discern intricate dynamic features inherent in the dynamic visual effect recognition of new media art. The VGG16 and GoogLeNet models exhibit comparable test accuracies, indicating similar performance in this particular task. VGG16 is renowned for its deep network architecture featuring numerous small convolution kernels, enabling the extraction of more intricate feature details. Conversely, GoogLeNet utilizes its distinctive Inception structure to facilitate parallel processing of features across various scales, thereby augmenting the model's expressive and generalization capabilities.

Referring to the findings presented in Table 2, it can be inferred that the VGG16 model's weight configuration achieves a balanced fitting state. This equilibrium suggests that the model neither simplifies the data excessively (underfitting) nor complicates it unnecessarily (overfitting), but rather adeptly captures the inherent patterns within the dataset. In this optimal state, the model maintains a robust fit with the training data while also demonstrating strong performance on novel, unseen datasets.

To substantiate the superiority of the visual effect optimization algorithm introduced in this article over traditional approaches, an experimental verification was conducted within the point cloud data registration module of the new media art design system. This verification employed the strategy design pattern. In this experiment, both the proposed algorithm and the conventional CNN algorithm were utilized for object reconstruction. A comprehensive comparison of the optimization efficiency between these two algorithms was undertaken, and the results are visually represented in Figure 5.

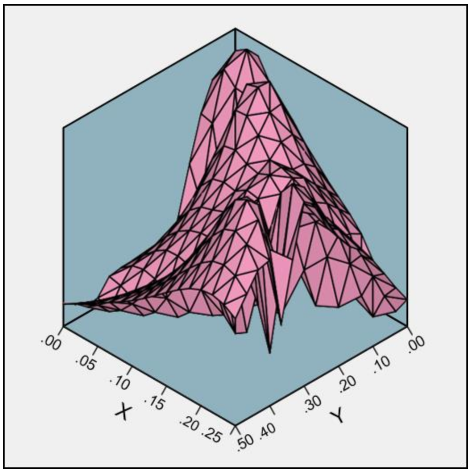

Figure 5: Algorithm comparison.

Figure 5 shows the efficiency of the two algorithms in matching search area points with spatial bounding box constraints as the number of iterations (or time) increases. We can expect to see that as the number of iterations increases, the performance of the algorithm will improve. The X-axis represents the number of iterations. The Y-axis represents the efficiency of point matching. The algorithm proposed in this study demonstrates clear superiority over the conventional CNN approach through comparative testing. It introduces an innovative approach by incorporating image feature point detection into the initial registration phase of point cloud alignment, significantly reducing the dimensionality and computational complexity of the rough registration stage. Additionally, the introduction of a spatial bounding box constraint rationalizes the search area, markedly enhancing the efficiency of point matching. Figure 6 shows the classification contrast adjustment.

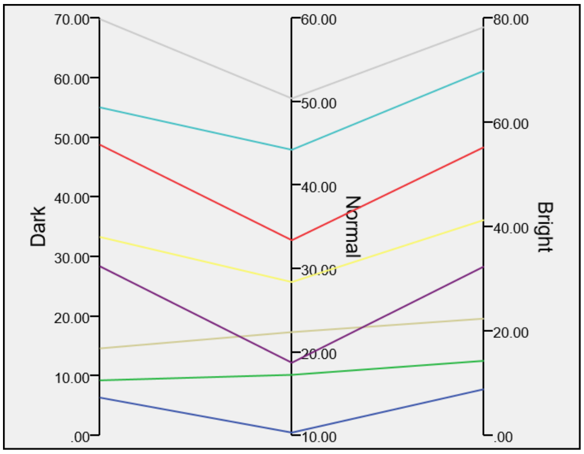

Figure 6: Classification contrast adjustment.

The "Dark", "Normal", and "Bright" in Figure 6 are likely to represent three different levels of contrast or brightness in image classification or examples. In target recognition, point cloud alignment, or other computer vision tasks, adjusting contrast and brightness is crucial for the accuracy and performance of algorithms. By adjusting the contrast and brightness of the image, it is possible to extract features better and improve point matching, thereby enhancing the efficiency and accuracy of the algorithm. In Figure 6, this classification contrast adjustment may be used to demonstrate the performance of the algorithm under different brightness conditions or to assist users or algorithms in better selecting or adapting image data with different brightness and contrast. The results of adaptive brightness correction are displayed in Figure 7. While enhancing image contrast, the technology utilizes dynamic range adjustment to retain the original image's detail information maximally. This approach effectively prevents undesirable outcomes, including detail loss and colour distortion, which are commonly associated with traditional contrast enhancement techniques. Consequently, the processed image appears more natural and realistic to the eye.

In the "Adaptive Brightness Correction" results shown in Figure 7, the three labels "Dark", "Normal", and "Bright" are commonly used to represent image examples under different brightness levels or conditions. By comparing these three image examples at different brightness levels, it is clear how adaptive brightness correction technology effectively preserves the details of the original image while enhancing image contrast, and making the processed image look more natural and realistic. This method is very useful for applications in visual fields such as new media art, as it can enhance the visual beauty of images while maintaining their authenticity and accuracy. This adaptive approach serves to enhance the visual aesthetics of new media art. Additionally, during the process of contrast improvement, dynamic range adjustment is employed to retain as much detail from the original image as possible, thereby minimizing the potential drawbacks of conventional contrast enhancement techniques.

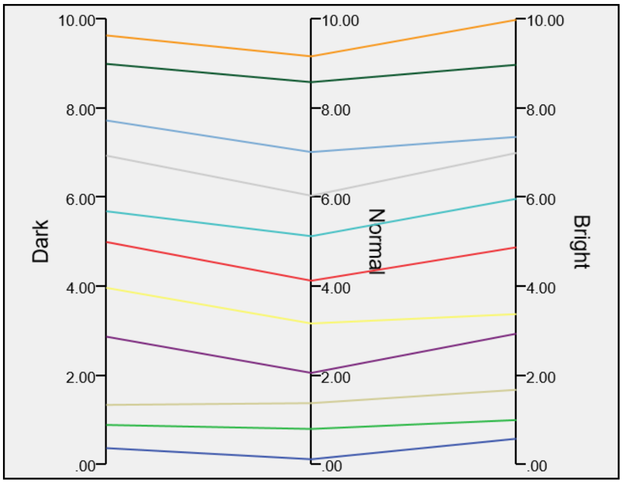

Figure 7: Adaptive brightness correction.

6 CONCLUSIONS

This article focuses on the process and implementation approach of experiential dynamic visual effect design based on intelligent technology. Design the interactive experience and process of the device according to the image requirements. Choose appropriate performance media and expression carriers, and finally implement the technical part based on the interactive experience method and expected effects. Connect and assemble the devices to achieve the goal of using interactive media landscape devices to optimize artistic images according to local conditions. In summary, digital media art is increasingly closely linked to people's lives and is developing towards intelligence, convenience, and benefiting people. As an increasingly important component of the cultural industry, countries around the world are increasing their support for the digital media art industry, and digital media art has entered an unprecedented period of rapid development. However, the progress and development of the digital media industry inevitably encounter many difficulties, such as inadequate regulation of new formats, insufficient copyright protection, and lack of creative and innovative talents. Digital media art, as an important component of contemporary social and cultural life, is increasingly integrating into people's daily lives, demonstrating significant features of intelligence, convenience, and benefiting the people.

Qiaqia Wang, https://orcid.org/0009-0000-9320-793X
Xiheng Yue, https://orcid.org/0009-0003-6110-9624

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