

Imagology and art feature extraction algorithm of advertising art from the perspective of secure digital media

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Abstract With the rapid development of modern information technology, new technologies such as big data, Internet+, and cloud technology continue to emerge. Digital media has been integrated into human daily life. The rapid development of digital media technology has greatly enriched the manifestations of the contemporary advertising industry. With its advantages of timeliness and accuracy, a variety of mobile multimedia devices quickly opened up the information market and replaced the traditional media advertising communication methods. At present, in order to better serve the people, advertising art and digital media must be organically combined and reintegrated to launch a new development direction. The application of advertising art images in the field of digital media has penetrated into all walks of life. The development of today's society is inseparable from the continuous innovation of new technologies. From the perspective of digital media, advertising art is quietly entering people's daily life and plays an important role. The experimental results showed that: in the field of non-digital media, the highest score for the quality of advertisements was only six points, and the satisfaction with advertisements was generally between 63% and 69%; from the perspective of digital media, people generally rate the quality of advertisements highly, and their satisfaction with advertisements was as high as 98%. It can be seen that the long-term development of the technological society is inseparable from the support of digital media, which also opens the way for the long-term development of advertising art in the new era.

Index Terms Digital Media, Advertising Art, Art Iconography, Art Image Feature Extraction

1. Introduction

With the advent of economic globalization, the development of society is inseparable from the support of new technologies, and the digital age of science has arrived. Digitization refers to converting a variety of original signals into digital signals through computer information processing technology, and converting initial information, images, etc. into digital codes. The processing and transmission of the data is then carried out. From the perspective of digital media, the iconography of advertising art is a new type of advertising method developed based on digital technology. Therefore, the research on the characteristics of digital media and the extraction method of artistic features has important practical significance. At present, the rapid development of information technology and Internet technology has gradually broken through the traditional development constraints. It continuously improves the design and manufacturing standards of its products, and under the integration of broadband network and wired network, it presents the characteristics of a new era. The iconography and extraction algorithm of advertising art is an important part of digital media art. It can bring strong visual stimulation to the audience and enhance the ability of language expression, so it has received more and more attention from researchers.

For a long time, subway screen advertisements, store posters, food menus, decoration design advertisements, etc. are all common advertising methods in advertising. Its characteristics are that the picture is clear and intuitive, but there is no difference in digging into its essence. It can be said that the integration of one picture and one picture becomes the so-called advertisement. However, with the development of the times and the progress of society, people's requirements for advertising are getting higher and higher. The traditional advertisements that can be seen everywhere can no longer express the information that human beings want to convey, let alone meet the requirements of the public. Therefore, it is very important to combine modern network technology and information technology to make the application of advertising art in digital media art a new development gate.

Digital technology is the vanguard of the information society. It is increasingly becoming the pursuit object of young people, and it is the most precious product of today's information age. Advertising art images from the perspective of digital media can be seen everywhere in human daily life. Its convenient and fast dissemination has

brought infinite benefits to human life, and has had a certain impact on some communication methods in the traditional era. While digital media has a huge impact on people's lives and deepens people's vision, it is also constantly improving and innovating. With the support of traditional technology, advertising art in the field of digital media is constantly innovating and expanding its art form. This brings a greater visual impact to people and makes people's lives better. In such a digital media vision, advertising art would serve people more effectively in continuous exploration and innovation.

II. Related Work

With the development of digital media technology, its combination with the image features of advertisements would bring a revolution to traditional advertisement design. It breaks the visual limitations of traditional media advertising in plane and static, and expands the original visual effect. At the same time, due to the support of digital media technology, the visual transmission in digital advertising can no longer completely rely on vision. It combines touch and vision in an interactive way to enhance the message of the ad. To sum up, the extraction of artistic image features of advertising art from the perspective of digital media would make advertising art integrate between technology and media, and further expand and deepen on this basis. Janmohammadi M's goal was to study how the content of digital advertisements is affected by the acceptance and rejection of digital advertisements. The survey variables included many aspects, and the path analysis and modeling of structural equations were used. The descriptive statistics and reliability test data were analyzed by social science statistical software, and the general model was verified by modeling software to verify the validity of the structure. The study found that, to a certain extent, consumers' cognition of advertising information can be effectively adjusted through trust in consumers. Moreover, market innovation can effectively regulate the link between advertising value and consumers' willingness to accept or reject a brand's intention [1]. Regarding whether advertising strategies from the perspective of digital media are beneficial to art companies, Chung Y studied the impact of advertising strategies in digital and traditional media on the performance of art companies, and explored potential factors related to the decision. A system of nonlinear simultaneous equations was estimated. The results showed that ad users of digital media were 51% more valuable than non-users. In addition, the effect of digital advertising is different in different companies, and companies with high income benefit more from the adoption of digital media advertising [2]. Visualization technology has been paid more and more attention, and its application scope is also expanding. Pryshchenko S aimed to compare traditional media advertising with digital media advertising. A systematic and multi-model methodology was adopted, which enabled the system structure, socio-cultural and contrastive approaches to be nationally oriented. In the first half of the 21st century, the style and development trend of advertising text has basically taken shape. Based on the analysis of contemporary trends, the stylistic characteristics of advertising art images were found: it maintains its unique personal style and monoculture; multiple styles coexist (multi-style); it explores new styles conceptually; it consciously returns to the source of national culture, and rethinks the popular theme, the universality and decorative role of folk art [3]. With the rapid development of modern technology, the advertising media industry is undergoing tremendous changes, from the traditional advertising model to the digital age. Compared with traditional advertising, digital advertising is more flexible, and various creatives have been generated due to the characteristics of its products. In addition, in digital advertising, visual communication design also plays a key role, which is also an important means to improve the quality of digital advertising. Therefore, in order to improve the quality of digital advertising, it must be optimized. Li H conducted an in-depth discussion on the visual communication design of digital media, and put forward corresponding countermeasures and suggestions on how to promote the development of digital media [4]. Continued technological advancements in advertising and the public sector, as well as the growing shift in marketing spending from traditional media to emerging digital media, are placing enormous pressure on advertising and public relations education. Although it is not yet known how educators are responding to digital challenges, Fang F's report showcased digital media education in advertising and public relations in the United States. He took 99 colleges and universities as the research objects. From the perspective of teaching content, about 1/4 of the courses in advertising and public relations are digital media courses, and technology courses are the main ones. In addition, advertising and public relations research is still based on mass communication, journalism and marketing, rather than computer-related fields. It is expected to provide some inspiration for future advertising and public relations education [5].

Currently, image feature extraction technology plays an important role in pattern recognition. For example, due to the constraints of printing size, printing method and other factors, the printing of many advertisements is unclear and skewed, and some even produce irregular handwritten signatures, which makes it difficult to identify digital symbols on advertisements. In response to this problem, Hu S proposed a new BP (multi-layer feedforward) neural network model based on the theory of image processing and recognition and improved information recognition

technology. In the advertising art image preprocessing, it is denoised and grayscale processed. After binarization, the slanted image was corrected using the Bresenham (Linear Scan Conversion) integer algorithm [6]. Zhang Y's goal was to study how to mine hidden information from complex image data to improve the recognition ability of advertising art images. By using BRISK (Binary Feature Description Operator) and SIFT (Local Feature Description Operator) technology, a new BRISK-based corner extraction method was presented. At the same time, combining SIFT scale space and BRISK algorithm, a new method for constructing scale space was presented. On this basis, an improved feature matching method was adopted and eliminated [7]. With the rapid development of mobile internet and digital technology, people's enthusiasm for photo sharing through social networking sites is increasing day by day. How to effectively extract similar images from massive images is a hot topic in the current image retrieval field. In the digital media environment, the selection of image characteristics is directly related to the retrieval effect of images. Compared with traditional feature extraction methods, the network structure of convolutional neural network (CNN) is more complex, and the ability to learn and express features is also stronger. By analyzing the overall features of CNN, Peng X found that when extracting artistic image features, local details could not be effectively described, so he proposed a strategy to generate local features by aggregating low-level CNN feature maps [8].

III. Advertising Art Iconography Based on Digital Media

III. A. Characteristics of Digital Media Advertising Art Iconography

Digital media has the characteristics of sharing, compatibility, and openness. Its design and expression are very complex, and the interaction effect is also very good. Moreover, the image characteristics of advertising art from the perspective of digital media can also make the content of the propaganda more real and effective and spread more widely. Under the influence of digital technology, the iconography of advertising art is more dependent on the intervention and support of digital media [9]. Digital technology is an important technology in digital media. This is essential for improving the penetration, storage and editability of media. In the traditional advertising industry, it mainly includes image creation, aesthetic requirements, etc. However, from the perspective of digital media, advertising art is no longer limited to the fixed thinking of traditional media art, but also includes many aspects. Digital media has greatly improved the operability of the advertising industry and the breadth of the design field. Relevant research believes that the main characteristics of advertising art from the perspective of digital media are as follows:

(1) With the development of computer technology and the innovation of digital technology, the use of various functions of computers can make the design of advertising art images more efficient and efficient. Digital technology makes it easier to disseminate artistic pictures and make them easier, so that designers can quickly present what they want to express on the computer screen [10]. The instant dissemination ability and infinite imagination of Internet art make digital media advertising art develop from individualized design to group, and thus produce a brand-new creativity. Digital technology has greatly replaced traditional manual and cumbersome operating procedures, and reduced fixed operations that have no technology at all, thereby improving the work efficiency of the entire advertising art design.

(2) Advertising art design from the perspective of digital media enables designers to express their design intentions more accurately and in detail. It can help designers to design more tedious line art, colors and exaggerated patterns. Therefore, the use of modern advanced scientific and technological means to synthesize the artistic image features of advertisements. From two-dimensional to three-dimensional, from 2D to 3D, designers can create more innovative advertising ideas according to their own real ideas [11]. In this digital age, traditional artworks or previously inaccessible complex ideas can be developed. In the image design of advertising art from the perspective of digital media, the use of virtual reality technology can not only model the design results anytime and anywhere, but also find out the deficiencies in the design in time and make timely improvements. This allows designers to unleash their design potential. The application of digital media technology to modern advertising design can promote a fundamental change in the aesthetic value of design. Designers can display the design intent of advertisements in a multi-angle, multi-level and all-round way through a variety of ways, so as to truly realize the comprehensive reproduction of sound, picture, text and image features of advertising art images [12]. In addition, digital art design can blur the boundaries between art and image technology to a certain extent, so that art and science can be highly integrated into a new artistic expression, which in turn produces a new aesthetic trend. Figure 1 is a brief summary of the main features of advertising art in digital media.

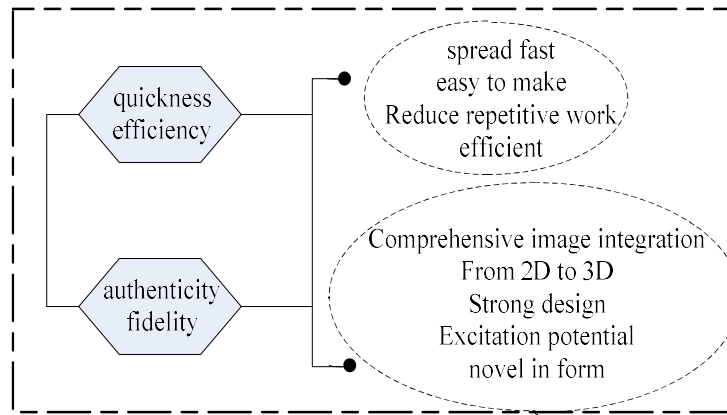


Figure 1: A brief summary of the main features of advertising art under digital media

III. B. Connection between Digital Media and Traditional (Non-digital) Media Iconography of Advertising Art

First of all, digital technology has relieved a lot of the creative burden of human beings, and has made new breakthroughs in many aspects. The advertising art image design of digital media has a significant impact on the design object and environment, and the use of modern technology can achieve the effect that traditional media cannot achieve [13]. At the same time, based on the experience of advertising design of traditional media, the design elements are referenced and innovated to make it more humanized, intelligent and appealing. This has also become the main factor that digital media advertising art can replace traditional media advertising art.

Secondly, from the perspective of digital media, the representation form and medium of the iconography of advertising art can more effectively improve the representation content of artistic images. Digital TV, interactive media, interactive games, network and virtual space are important carriers and ways of information exchange. Innovative breakthroughs can be made in the traditional visual communication design field, while digital media can greatly improve the connotation and design methods of visual communication. Digital media advertising art design is the inheritance of aesthetic evaluation and theoretical design of traditional media art design. For example, as a product of promoting the development of modern advertising design, digital media makes advertising art images have certain characteristics of the times. Its artistic connotation and data reserves are also very rich, and it can stand the test of the wave of the technological era [14].

In traditional advertising art image design, designers usually draw first drafts, final drafts, design intentions, sources of inspiration, art sketches, etc. by hand. However, design and production are not done by one person, and designers need to get more information from user feedback, which leads to a vacuum gap between design and experience. Through the use of digital technology and digital media for artistic design, the design effect can be more stable, the modification is easier, and the storage is more convenient [15]. In this way, the vacuum gap between the original design and the real experience can be closed. By using the iconography of advertising art in the field of digital media, designers can design in the actual application environment, so as to be closer to reality. This makes the overall effect achieve a qualitative leap, thus avoiding the limitations of traditional media on advertising art. Table 1 shows the correlation between digital and non-digital media.

Table 1: Relevant links between digital media and non-digital media

Related Links/Comparisons	non-digital media	digital media
advertising content	single	diversification
design effect	Poor	Better
spread	64.33%	97.28%
The vacuum between design and experience	92%	Hardly
innovative	58.65%	96.88%

III. C. Influence of Digital Media Technology on Advertising Art Design

In recent years, with the continuous improvement of digital media technology, great progress has been made in both the production and form of advertisements, as well as the production quality and level of advertisements. The application of modern technology can better meet the requirements of modern society. With the advent of the

digital age, people's visual experience has been greatly improved. The popularization and application of a variety of digital media have enabled the rapid development of advertising [16].

At present, due to the rapid development of digital TV, mobile TV and other technologies, the viewing mode of viewers has undergone tremendous changes, which is very different from the previous TV. Today's advertisements are more vivid and intuitive, and their viewing and fidelity have been greatly improved [17]. In order to improve advertising creativity and increase the vitality and attractiveness of advertisements, the current advertising design in the field of digital media has been adopted by more and more people. The specific performance of digital media art in advertising mainly includes the following points: (1) With the help of digital media, the design and production of advertisements can make the audience have a strong visual impact and enhance the audience's visual experience. The new advertising expression developed by digital media technology has greatly broadened people's imagination, and made advertising images and virtual objects to be more deeply integrated, thereby improving the creative effect. (2) For a long time, the design and production of non-digital advertisements have been greatly restricted due to the limitation of using tools [18]. Therefore, its advertisement broadcast quality and effect are relatively poor, and its dissemination range is relatively narrow. However, due to the advent of digital media, the colors of advertisements and the fidelity of pictures have been greatly improved, and the performance space of advertisements has also been greatly expanded. In addition, the quality of advertising has been improved, and the field of communication has also been widely recognized and accepted. (3) In today's increasingly competitive society, if the media wants people to remember the content of advertisements, they must constantly improve their creativity and value to achieve better publicity effects. Digital media art greatly enriches and expands the creativity of advertisements, and has made great innovations in the design and production of advertisements, thus making the advertisement design more diverse [19]. For example, the diversified advertising design of VR advertising combines modern photography technology with a variety of post-processing software to make the advertisement appear richer in color. Therefore, it achieves a deep creativity while maintaining the original advertising content and form [20].

III. D. Theory and Evaluation of Feature Extraction Algorithms for Advertising Art Images

As the core technology in the fields of image retrieval, matching, fusion, etc., art image feature extraction is an important subject in the field of image retrieval. Extracting image feature points from advertisements is an important research direction in artificial intelligence and computer vision technology. It mainly uses the relevant algorithm of the computer to extract the image to determine whether it has a specific identification factor [21]. Images usually contain various properties such as texture, feature points, shape, and color, which have been described by many scholars. In this paper, three different feature extraction methods were used, and their characteristics were analyzed and compared through experiments.

III. D. 1) Canny Edge Detection

Canny operator is a common edge detection algorithm. The general detection method consists of the following four parts: (1) By smoothing the image, the noise is removed. (2) The grayscale intensity change of the image is calculated. (3) In the case of suppressing other points, the local maximum gradient of the image is maintained to improve the sharpness of the edge. (4) By using the double threshold method, the edges are connected to obtain the final result. Canny operator has lower false detection rate and better elimination of false edges. It is a multi-level edge detection method with good edge detection performance. However, the disadvantage is that the detection ability of images with fine and complex edges is very weak, and it is easy to cause edge errors or missed detections, so that the noise problem cannot be effectively solved, thus affecting the detection effect.

Test results and analysis

Figure 2 shows the experimental results of edge detection using the Canny operator. It can be seen from the test results that the Canny operator has better detection ability and higher positioning accuracy. In image detection, in order to improve the edge extraction of the image, a small Gaussian filter is used for image segmentation, and a large Gaussian filter is used to smooth the edge of the image. Although there is some flexibility in setting double thresholds in the algorithm, it is difficult to find a general threshold that applies to all boundaries.



Figure 2: Experimental result of edge detection using Canny operator

III. D. 2) Harris Corner Detection

Harris' corner extraction is a method of point feature extraction in a local small window. When a small point moves in either direction, its grayscale changes dramatically, and this point is called a corner. The grayscale changes are specified as Formula (1):

$$F(\Delta m, \Delta n) = \sum_{m,n} [L(m + \Delta m, n + \Delta n) - L(m, n)]^2 \quad (1)$$

In Formula (1), $L(m, n)$ is the gray value of the pixel; L_m and L_n are the partial derivatives of the image $L(m, n)$; the horizontal displacement is Δm , and the vertical displacement is Δn . It is specified by the Taylor series expansion:

$$F(\Delta m, \Delta n) = \sum_{m,n} [L(m, n) + \Delta m L_m + \Delta n L_n - L(m, n)]^2 \quad (2)$$

After sorting, it can be obtained:

$$F(\Delta m, \Delta n) = \sum_{m,n} [\Delta m^2 L_m^2 + \Delta n^2 L_n^2 + 2\Delta m \Delta n L_m L_n] \quad (3)$$

It can also be expressed like this:

$$F(\Delta m, \Delta n) = \sum_{m,n} [(\Delta m, \Delta n) \begin{pmatrix} L_m^2 & L_m L_n \\ L_m L_n & L_n^2 \end{pmatrix} \begin{pmatrix} \Delta m \\ \Delta n \end{pmatrix}]^2 \quad (4)$$

It is supposed that the window function is:

$$M = \sum_{m,n} \omega(m, n) \begin{pmatrix} L_m^2 & L_m L_n \\ L_m L_n & L_n^2 \end{pmatrix} \quad (5)$$

The corner function is:

$$\alpha = \det(M) - k * \text{trace}^2(M) \quad (6)$$

Among them, $\det(M)$ is the determinant of M , and k is a constant; $\text{trace}(M)$ is the linear trajectory of M . If α is greater than the given threshold, then the corner exists.

The main implementation regulations of the Harris algorithm are as follows:

- (1) The gradients L_m and L_n of the image $L(m, n)$ in the m and n directions are calculated;
- (2) The products L_m^2 , L_n^2 , and L_{mn} of the directional gradients are calculated;
- (3) Gaussian weighting L_m^2 , L_n^2 , and L_{mn} with a Gaussian function;
- (4) α is calculated. If α is greater than the given threshold, keep it; otherwise return to 0;
- (5) Non-maximum suppression.

Test results and analysis

Figure 3 shows the result of Harris corner detection.

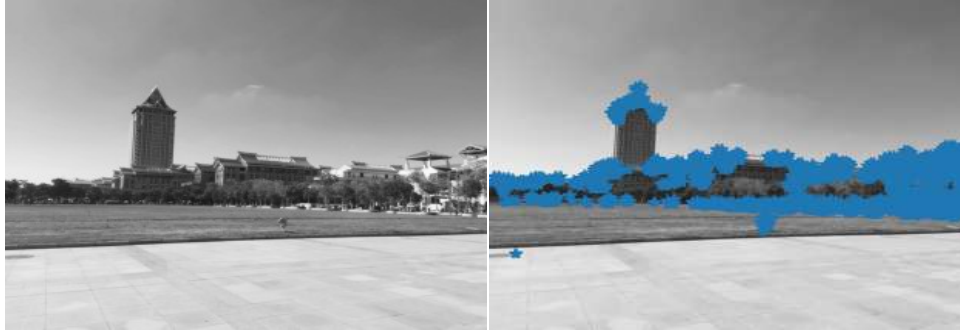


Figure 3: Harris corner detection results

It can be seen from the results that in Figure 3, an empirical constant with a parameter k of 0.05 is used. If k is greater than 0.05, the sensitivity of the method is low, and the detection results would be reduced. When the k value is lower than 0.05, the detection sensitivity of the corner points would increase, and the number of corner points would also increase, which is usually between 0.04 and 0.06. Harris corner detection is not affected by brightness and contrast, and the extracted feature points are relatively stable. However, it is sensitive to scale changes and needs to improve real-time performance.

III. D. 3) Log Spot Detection

The blob detection algorithm steps are: ①Convolve the image with the Gaussian function. ②Search for the local extreme point of the response, and this pixel point is the detected image spot. Thus it is stipulated as:

$$\vartheta(m, n, \sigma) = \frac{1}{2\pi\sigma} e^{-\frac{(m^2+n^2)}{2\sigma^2}} \quad (7)$$

Its Laplace transform is:

$$\Delta^2 \vartheta = \frac{\varphi^2 \vartheta}{\varphi m^2} + \frac{\varphi^2 \vartheta}{\varphi n^2} \quad (8)$$

The normalized Gaussian Laplace transform is:

$$\Delta_{norm}^2 = \sigma^2 \left(\frac{\varphi^2 \vartheta}{\varphi m^2} + \frac{\varphi^2 \vartheta}{\varphi n^2} \right) \sigma^2 \Delta^2 \vartheta = -\frac{1}{\pi \sigma^2} \left[1 - \frac{m^2+n^2}{2\sigma^2} \right] e^{-\frac{(m^2+n^2)}{2\sigma^2}} \quad (9)$$

The extreme value is sought, and there are:

$$\frac{\varphi(\Delta_{norm}^2 \vartheta)}{\varphi m} = 0 \quad (10)$$

It can be seen that the Log blob detection can obtain the area information that cannot be obtained by Canny edge detection and Harris corners, and these information are the main features of digital images.

Test results and analysis

Figure 4 is a graph of the results of the Log spot detection experiment.



Figure 4: The result of the Log spot detection experiment

It can be seen from the above test results that what Log obtains is a local information. Its stability is better than a single corner point, and can effectively suppress noise.

On this basis, the effects of the above feature extraction algorithms are analyzed and compared. The Canny edge detection operator can accurately and clearly extract images with simple contour information, but it is prone to false detection and missed detection. Harris' corner detection is a point feature extracted from an image, which is not affected by brightness and contrast, but is sensitive to changes in scale. Compared with the edge obtained by Canny and the data obtained by Harris, Log blob detection can obtain better image area information, and has better stability and better anti-noise.

IV. Comparison of Survey Data Related to Digital Media and Non-digital Media

Advertising art images in digital media provide rich ideas for advertising content in non-digital media and expand it. The image design of digital media advertising art integrates aesthetics with traditional Chinese design ideas. For example, taking digital media as an example, when designing advertising art, the first thing to consider is whether it can meet the functional needs of people, and the second thing to consider is whether it meets the aesthetic needs of the public. In addition, compared with non-digital media, digital media have many similarities in expressing content, creative ideas and conceptual methods. There is a sharp contrast between the two in terms of advertising picture quality, advertising dissemination range, artistic expression space, mass satisfaction, aesthetics, and innovation. Figure 5 shows the comparison of the quality of advertisement images.

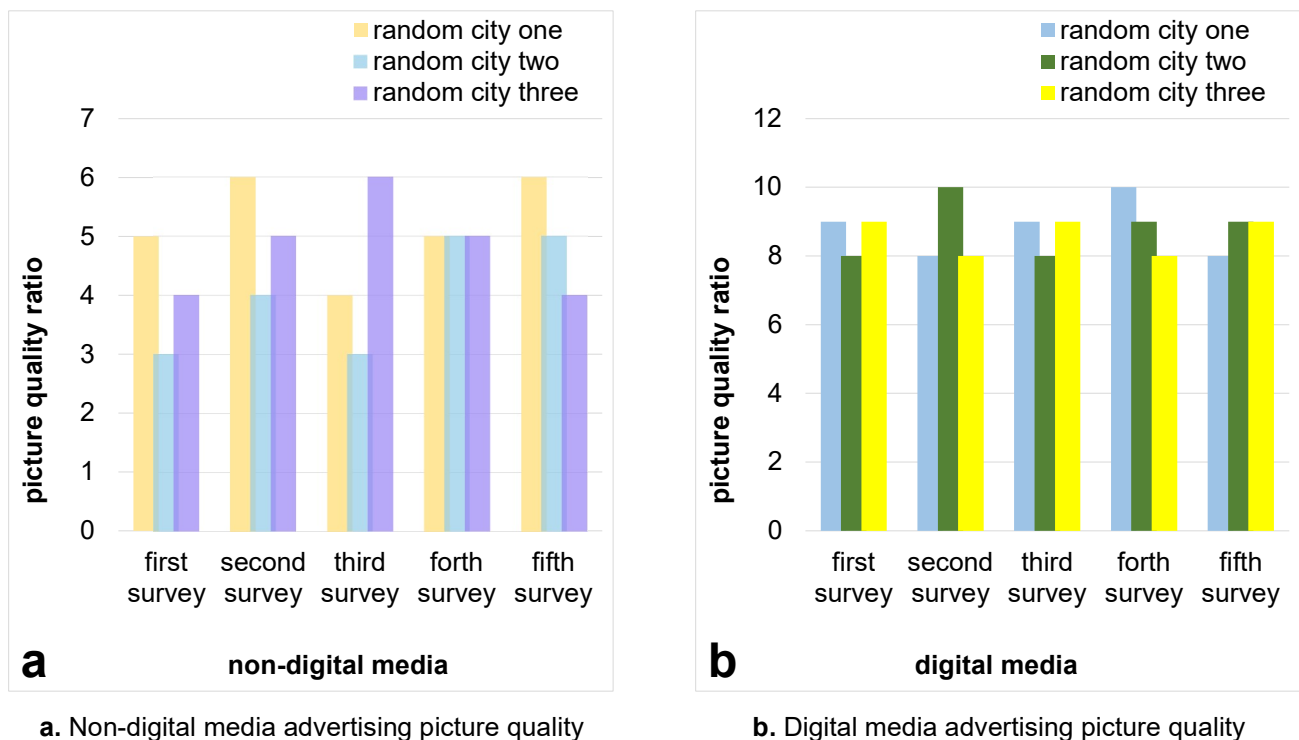
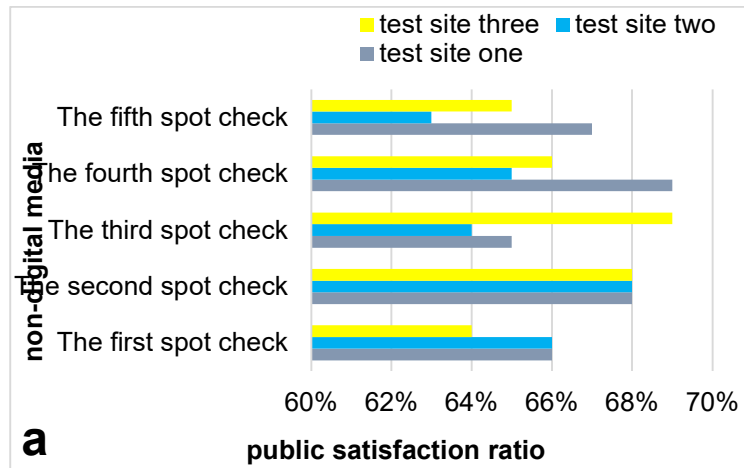
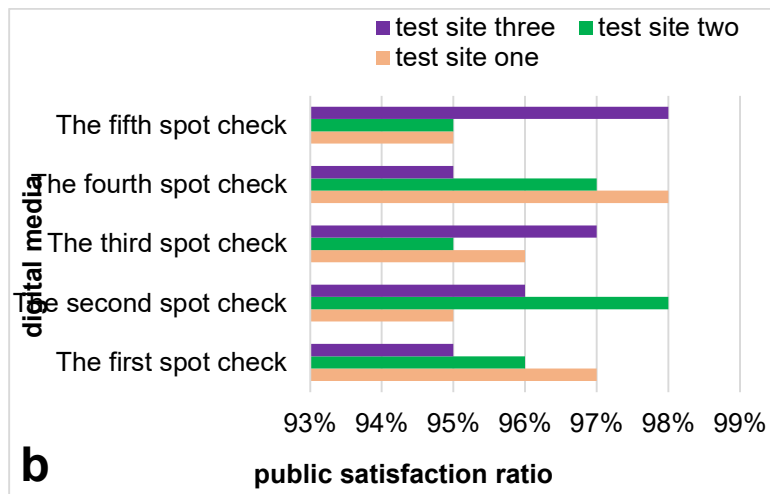


Figure 5: Ad screen quality comparison

The picture quality survey shown in Figure 5 adopted a scoring system (1-10 points). From Figure 5a, it can be seen that in the non-digital media perspective, the highest score for the quality of advertisements was only six points, which showed that the quality of advertisements is worrying. From the perspective of digital media, it can be seen from Figure 5b that it is no longer uncommon for the masses to score a full score of 10. However, society still has to work hard to develop new technologies, and standing still is in a way another step backward. Figure 6 shows the comparison of mass satisfaction.



a. Non-digital media mass satisfaction



b. Digital media mass satisfaction

Figure 6: Mass satisfaction comparison

From the data analysis in Figure 6a, it can be seen that in the non-digital media perspective, the public's satisfaction with advertising was generally between 63% and 69%, which was relatively low. It is obviously difficult to adapt to the rapid development of today's society. From the perspective of digital media, it can be seen from Figure 6b that the public's satisfaction with advertising was as high as 98%, which opened up the way for the inheritance of art and the long-term development of society. Figure 7 shows the spatial comparison of artistic expression.

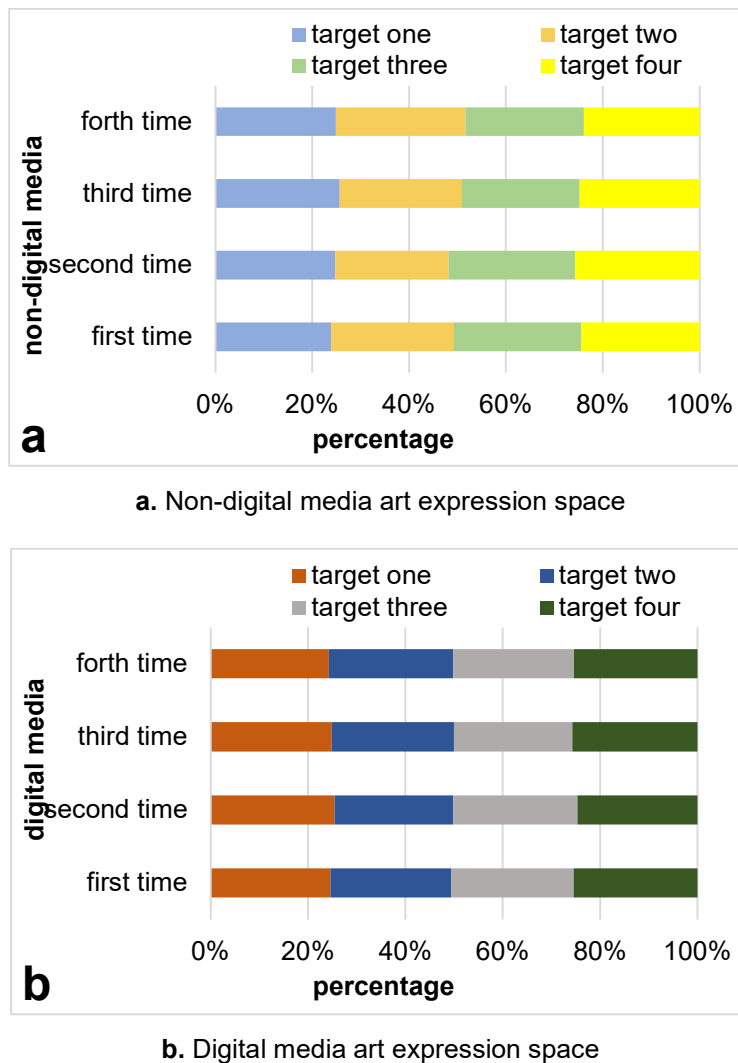


Figure 7: Artistic expression space comparison

From Figure 7a, it can be found that the advertising art performance space in non-digital media was completely hovering at 50%~56%, and even 60% was out of reach. In Figure 7b, the performance space of advertising art under digital media was as high as 95%. It can be seen that the long-term development of the technological society and the continuous innovation of advertising art are inseparable from the support of digital media.

V. Conclusions

In short, with the development of digital technology and modern design technology, the integration of art and technology is more and more targeted and operable. The development of digital media technology has made the expression and artistic style of advertising art more diverse. At the same time, the innovation of advertising art has also greatly improved the practicability of digital media, thus promoting the continuous innovation of digital media. From the perspective of digital media, advertising art has a profound impact on the artistic design of non-digital advertising in a sense, and it has also played a role in promoting it to a certain extent. From the perspective of digital media, advertising art would have a rapid development and innovation, which would bring greater development space to the development of advertising art. However, in the digital media environment, China's advertising art image design still has certain defects, and it is necessary to cultivate a group of high-quality artistic innovation talents in order to make the digital media advertising art cause better development.

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References

- [1] Janmohammadi M. Investigating the impact of digital media advertising content on accepting or rejecting the message mediated by advertising value and modifier of brand trust and marketing innovation (case study: citizens of the west of Tehran)[J]. *International Journal of Electronic Marketing and Retailing*, 2022, 13(2):206-212.
- [2] Chung Y, Chang H H, Kitamura Y. Digital and traditional media advertising and business performance of agribusiness firms – Empirical evidence in Japan[J]. *Agricultural Economics*, 2021, 18(67):99-102.
- [3] Pryshchenko S. Prospects for development of advertising graphics in the traditional and digital media[J]. *Research and methodological works of the National Academy of Visual Arts and Architecture*, 2020, 9(29):54-59.
- [4] Li H. Visual Communication Design of Digital Media in Digital Advertising[J]. *Journal of Contemporary Educational Research*, 2021, 5(7):36-39.
- [5] Fang F, Wei W, Huang H. Keeping Up With Fast-Paced Industry Changes—Digital Media Education in U.S. Advertising and PR Programs[J]. *Journal of Advertising Education*, 2019, 23(2):80-99.
- [6] Hu S. Research on Data Acquisition Algorithms Based on Image Processing and Artificial Intelligence[J]. *International Journal of Pattern Recognition and Artificial Intelligence*, 2020, 34(6):1-13.
- [7] Zhang Y. Image feature extraction algorithm in big data environment[J]. *Journal of Intelligent and Fuzzy Systems*, 2020, 39(1):1-10.
- [8] Peng X, Zhang X, Li Y. Research on Image Feature Extraction and Retrieval Algorithms Based on Convolutional Neural Network[J]. *Journal of Visual Communication and Image Representation*, 2019, 69(6):102-105.
- [9] Peluso A M, Pino G, Amatulli C. Luxury advertising and recognizable artworks New insights on the "art infusion" effect[J]. *European journal of marketing*, 2017, 51(11):2192-2206.
- [10] Longo D R. Tobacco advertising and the art and science of persuasion[J]. *Tobacco induced diseases*, 2020, 2(1):95-99.
- [11] Girija S. A Case Study of Production Practices and User Participation in an Advertising-Free Digital News Media Organisation[J]. *Triplec*, 2019, 17(1):38-55.
- [12] Vadivukarassi M, Puviarasan N, Aruna P. Tweet categorization and image retrieval using proposed feature extraction method with subspace clustering algorithms[J]. *International Journal of ChemTech Research*, 2018, 11(8):325-346.
- [13] Peicheva D, Milenkova V. Knowledge society and digital media literacy: Foundations for social inclusion and realization in bulgarian context[J]. *Calitatea Vietii*, 2017, 28(1):50-74.
- [14] Verena, Hüttl-Maack. Visual art in advertising: New insights on the role of consumers' art interest and its interplay with the hedonic value of the advertised product[J]. *Journal of Product & Brand Management*, 2018, 27(3):100-110.
- [15] Peseckien D. Practice of applying visual advertising to Lithuanian contemporary art[J]. *Vilnius University Open Series*, 2019, 8(2):62-66.
- [16] Ciobanu C I. Some notes on the iconography of the Vita cycle of Gerasimus of the Jordan in Romanian painting[J]. *Anastasis Research in Medieval Culture and Art*, 2019, 6(1):9-44.
- [17] Yang Y, Wang Z, Yang C. A Virtual Modeling Method of Digital Media Image Synchronization Based on Motion Hybrid Algorithm[J]. *Journal of Physics: Conference Series*, 2021, 982(1):121-128.
- [18] Ceranoglu T A. Inattention to Problematic Media Use Habits : Interaction Between Digital Media Use and Attention-Deficit/Hyperactivity Disorder[J]. *Child Adolesc Psychiatr Clin N Am*, 2018, 27(2):183-191.
- [19] Dalope K A, Woods L J. Digital Media Use in Families: Theories and Strategies for Intervention[J]. *Child & Adolescent Psychiatric Clinics of North America*, 2018, 27(2):145-158.
- [20] Reyna J, Hanham J, Meier P. A taxonomy of digital media types for learner-generated digital media assignments[J]. *E Learning & Digital Media*, 2017, 14(6):309-322.
- [21] Allmer T, Bulut E. Academic Labour, Digital Media and Capitalism (Combined PDF of all articles)[J]. *Triplec*, 2018, 16(1):44-240.