

Anhui Phoenix painting Art: The Application of Digital Innovation Design in the New Era

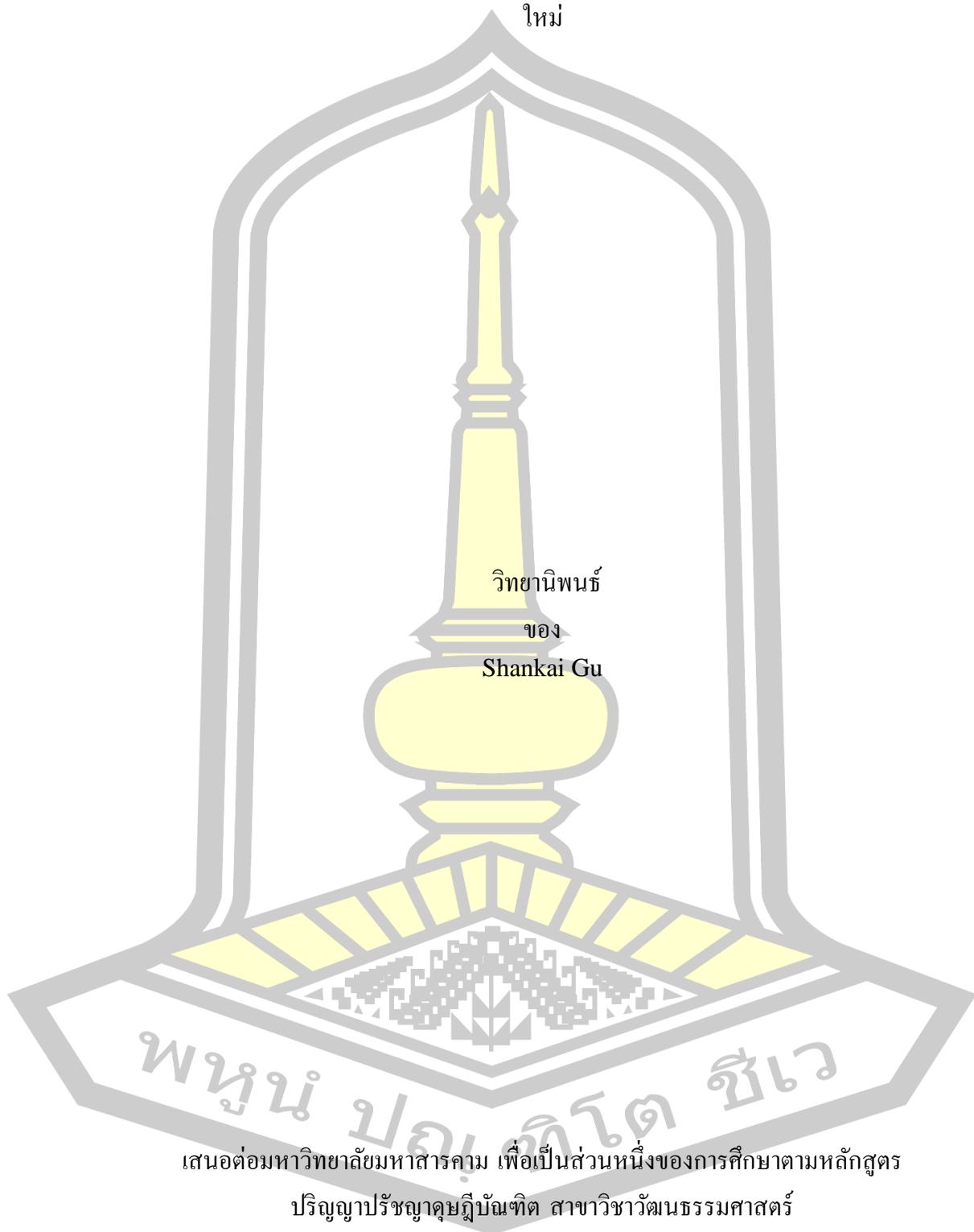
Shankai Gu

A Thesis Submitted in Partial Fulfillment of Requirements for
degree of Doctor of Philosophy in Cultural Science

April 2024

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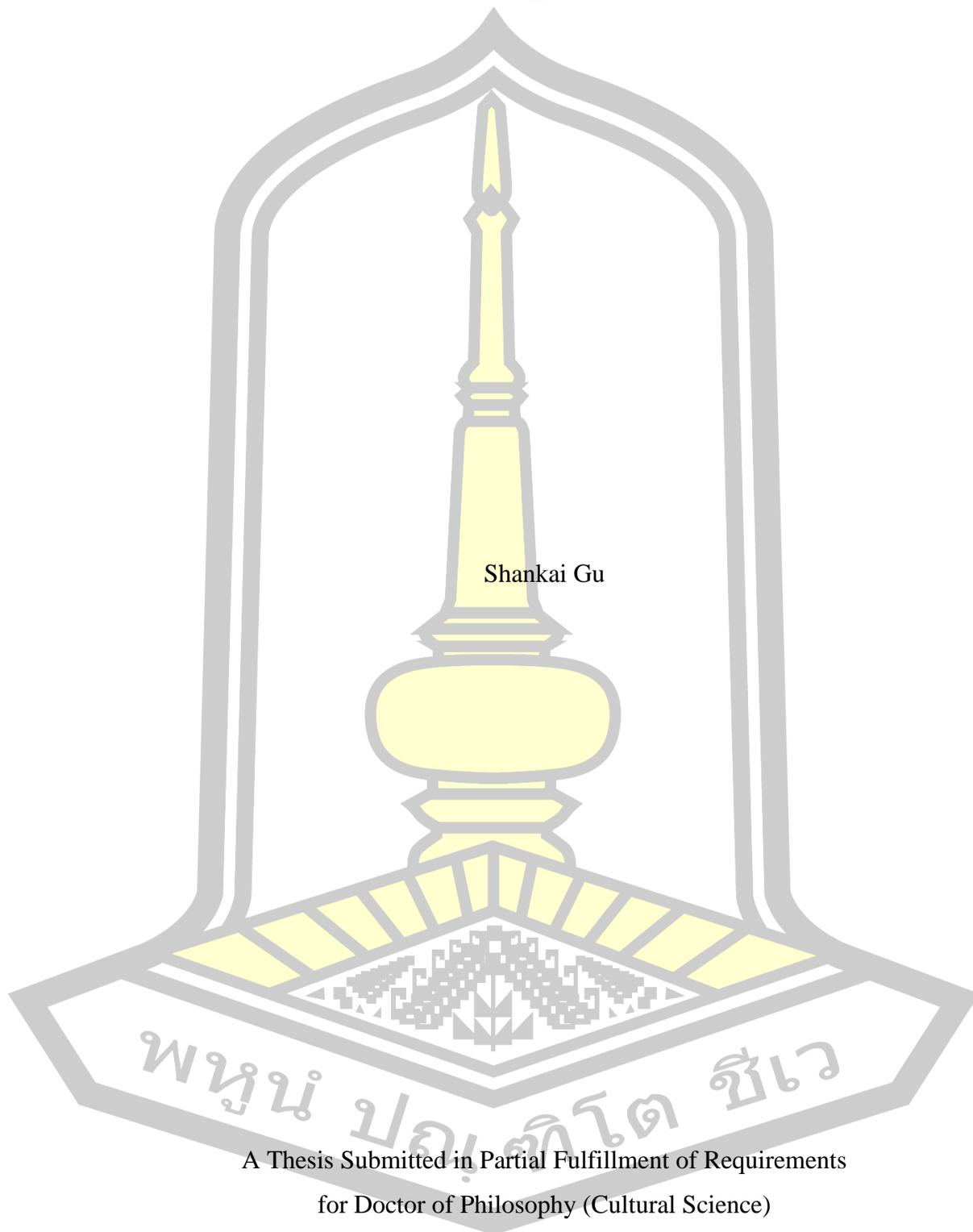


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Anhui Phoenix painting Art: The Application of Digital Innovation Design in the New Era



Shankai Gu

A Thesis Submitted in Partial Fulfillment of Requirements
for Doctor of Philosophy (Cultural Science)

April 2024

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The examining committee has unanimously approved this Thesis, submitted by Mr. Shankai Gu , as a partial fulfillment of the requirements for the Doctor of Philosophy Cultural Science at Mahasarakham University

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ABSTRACT

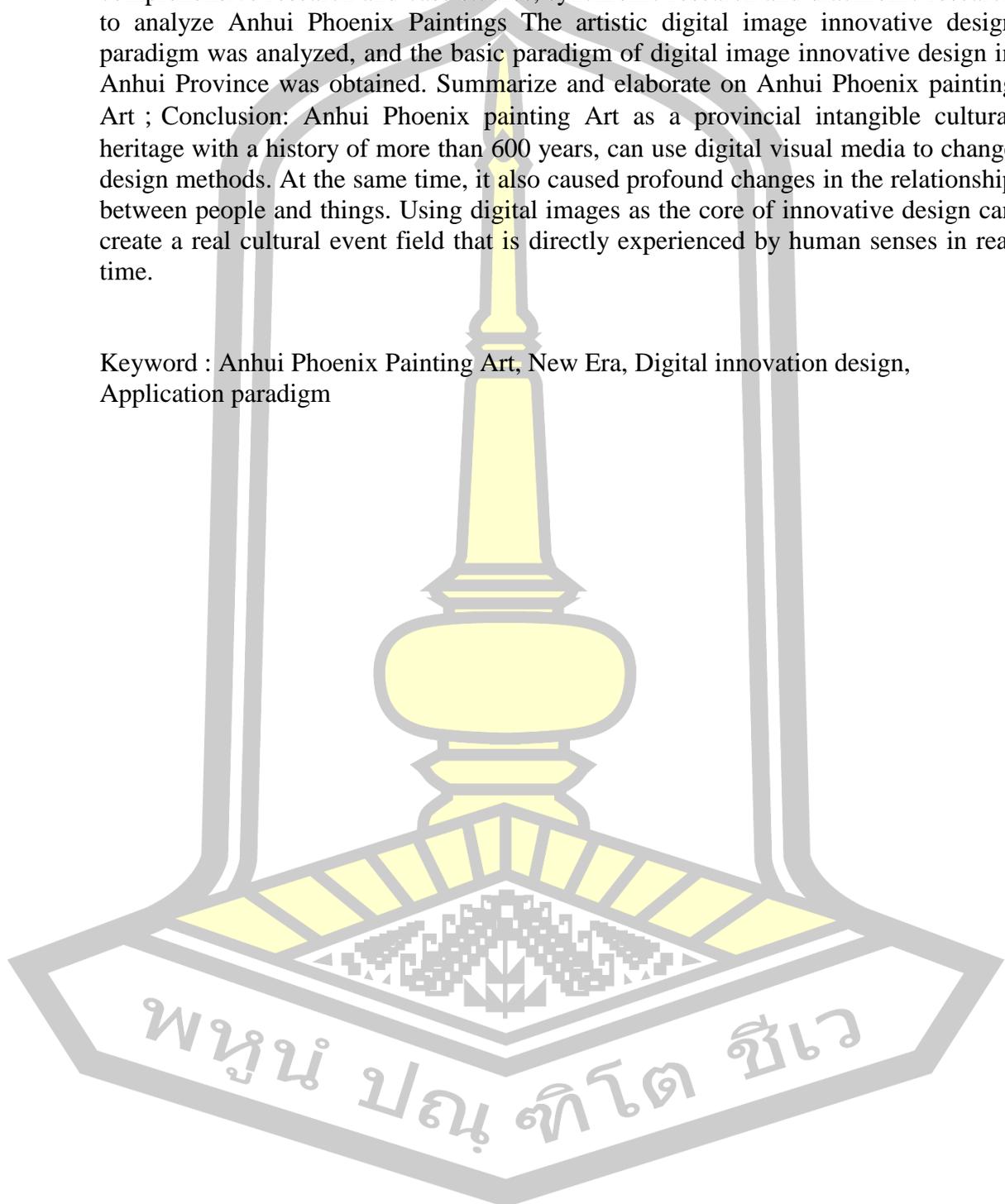
The research objectives of the article were 1) To study the historical origins, artistic value and cultural identity of Anhui phoenix painting art. 2) To study the image composition, aesthetic characteristics and innovative applications of Anhui phoenix painting art. 3) To study the application paradigm of Anhui phoenix painting art in digital innovation design in the new era.

The research object of this article is Anhui phoenix painting art, which is a unique folk painting art in Anhui, Anhui Province, also known as "dragon and phoenix painting". Phoenix painting has a very long history. It originated in the Ming Dynasty and flourished in the Qing Dynasty. It has a history of more than 600 years. As early as 2006, Anhui Phoenix Painting became one of the first batch of intangible cultural heritage in Anhui Province and is well-known at home and abroad. Anhui phoenix painting art is not only an important cultural heritage of thousands of years of Chinese civilization, but also contains rich historical information and cultural value. It is also an important carrier of cultural construction and dissemination in today's rural construction and development. Has important research, conservation and heritage value. As an important fulcrum of Anhui culture, Anhui phoenix painting art is typical and representative in traditional Chinese art and has extremely high artistic, cultural and historical value.

This article takes the phoenix painting art of Anhui as the research object, and under the requirements and guidance of the "Opinions on Promoting the Implementation of the National Cultural Digitalization Strategy" issued by the General Office of the CPC Central Committee and the General Office of the State Council, using digital innovation design as the research approach and method, focusing on The essence of constructing the "mutual integration strategy" of Anhui Phoenix painting Art practice mechanism and digital innovative design technology is to rely on digital technology to integrate the "correlator" (technology) through innovative design and practice mechanisms to integrate the main construction and spatial meaning of Wandong's traditional art. , transformation narrative and other elements are effectively integrated to realize the inheritance, development and sharing of traditional art in eastern Anhui. When the technical conditions are in place, the panoramic view of Chinese culture can be realized. Value.

This article studies the innovative design paradigm of digital images in Anhui Phoenix painting Art from the perspective of design culture theory; Methods: This article uses methods such as image composition analysis and digital technology, comprehensive research and case studies, synchronic research and diachronic research to analyze Anhui Phoenix Paintings The artistic digital image innovative design paradigm was analyzed, and the basic paradigm of digital image innovative design in Anhui Province was obtained. Summarize and elaborate on Anhui Phoenix painting Art ; Conclusion: Anhui Phoenix painting Art as a provincial intangible cultural heritage with a history of more than 600 years, can use digital visual media to change design methods. At the same time, it also caused profound changes in the relationship between people and things. Using digital images as the core of innovative design can create a real cultural event field that is directly experienced by human senses in real time.

Keyword : Anhui Phoenix Painting Art, New Era, Digital innovation design, Application paradigm



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Finally, I would like to thank my parents for their silent dedication and support throughout my study career, and all my teachers, classmates, and friends who have helped me and grown up.

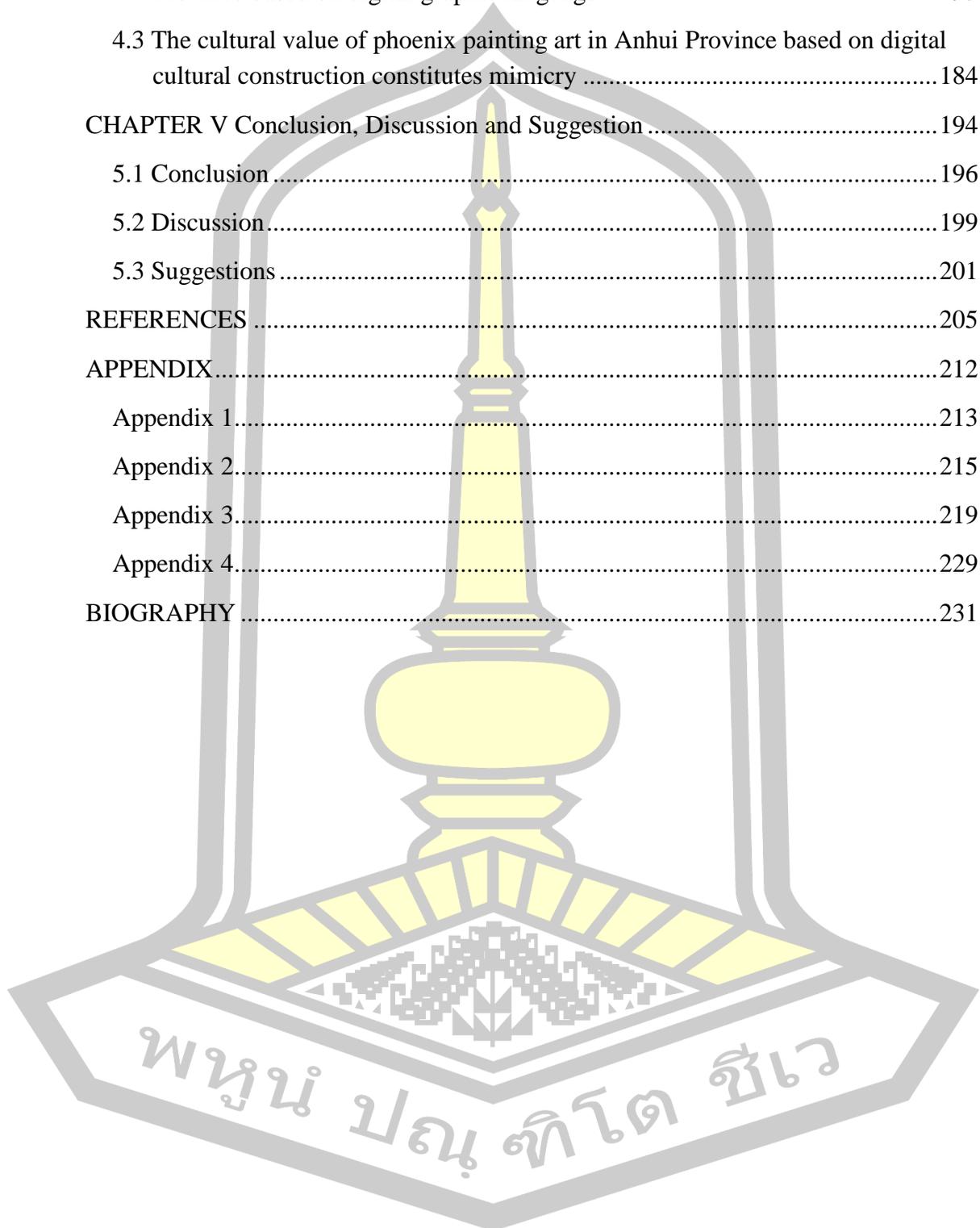
I would like to thank all the professors and teachers in the cultural science major at Mahasarakham University for giving me motivation to study and help in life. I would also like to thank all my friends and classmates who are willing to help me when I encounter difficulties.

Shankai Gu

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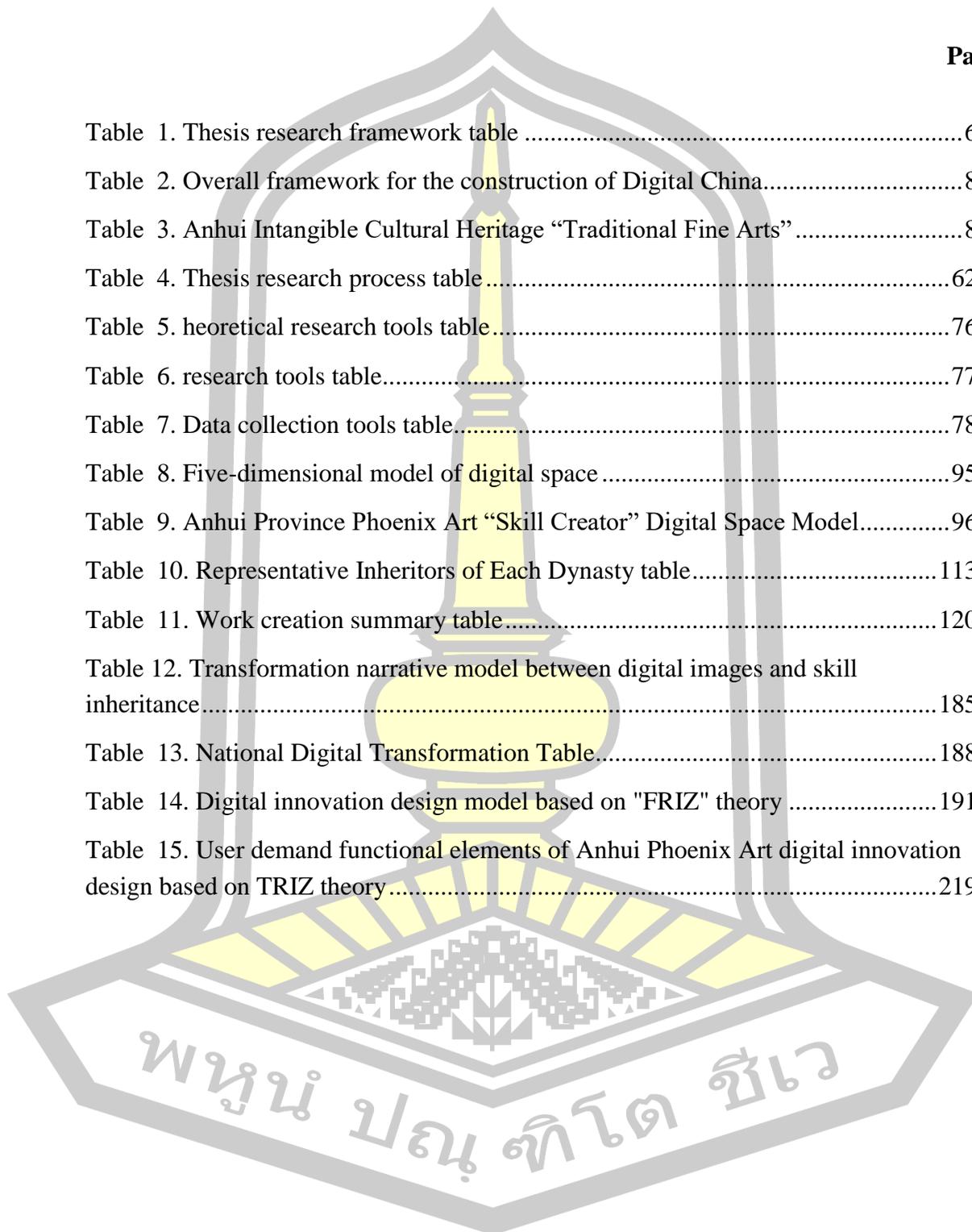
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CHAPTER I

Introduction

- 1.1 Research background
- 1.2 Research objectives
- 1.3 Research questions
- 1.4 Research significance
- 1.5 Definition of terms
- 1.6 Conceptual Framework

1.1 Research background

On May 22, 2022, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued the "Opinions on Promoting the Implementation of the National Cultural Digital Strategy" and issued a notice requiring all regions and departments to conscientiously implement it based on actual conditions. The opinion pointed out that by the end of the "14th Five-Year Plan" period, cultural digital infrastructure and service platforms will be basically completed, and a cultural service supply system that integrates online and offline interactions and has three-dimensional coverage will be formed. By 2035, a national cultural big data system with physical distribution, logical association, quick links, efficient search, comprehensive sharing, and key integration will be built. A panoramic view of Chinese culture will be presented, and the digital achievements of Chinese culture will be shared by all.

As a product of the combination of digital technology and culture, the digitalization of Chinese culture embodies the development trend of cultural modernization. It has been elevated to a national strategy based on years of practical exploration and theoretical research. It is in line with the century-old Chinese cultural

modernization process and aims to be faster and more. It is necessary to promote the cultural modernization of the huge population, enrich the spiritual world of the people in the new era, promote the modernization of cultural governance and maintain cultural security. The implementation of the national cultural digitalization strategy with the digitalization of public culture and the digitalization of cultural industries as the "two wings" is the proper meaning of Chinese-style cultural modernization.

Chinese folk art is an important part of Chinese culture. It has experienced thousands of years of historical precipitation and is a treasure summed up by the working people of our country during thousands of years of life. Our country's folk art contains extremely high aesthetic value. It also includes various activities of our people from ancient times to the present and the development context of thousands of years of history. Chinese folk art refers to art forms created by ordinary people as the main body, as shown below () including traditional folk painting, paper-cutting, shadow puppetry, clay sculpture, etc., as well as the innovation and development of modern folk art forms. Its emergence is closely related to the labor production and life practices of ancient ancestors.

From the design of simple utensil shapes to colorful paintings, folk art has a long history of practice and creation. With the continuous development of human productivity, folk art has begun to penetrate into people's daily necessities, food, housing and transportation. As a country with ancient civilization, the creativity of Chinese folk art is one of the most dynamic art forms in the world.

With the continuous development of human productivity, folk art has begun to penetrate into people's daily necessities, food, housing and transportation. As an ancient civilization in China, the creativity of folk art is one of the most dynamic art forms in the world. Anhui phoenix painting art was selected as the intangible cultural heritage of Anhui Province in 2006. Like paper-cutting, shadow puppetry, and clay sculpture, it is a representative of Chinese folk art, but it has not received enough

attention. This paper studies Anhui phoenix painting art. The object, using digital innovative design as the research approach and method, focuses on constructing the "mutual integration strategy" of Anhui Province's phoenix painting art images and digital innovative design. The essence is: relying on modern digital innovation technology, Anhui Province's phoenix painting art images "Related persons" integrate effectively and mutually, while achieving the inheritance and development of Anhui Phoenix art under new technological conditions, and at the same time realizing its shared value in the Chinese cultural panorama.

1.2 Research objectives

1.2.1 To study the historical origins, artistic value and cultural identity of Anhui phoenix painting art.

1.2.2 To study the image composition, aesthetic characteristics and innovative applications of Anhui phoenix painting art.

1.2.3 To study the application paradigm of Anhui phoenix painting art in digital innovation design in the new era.

1.3 Research questions

1.3.1 What is the historical origin, artistic value and cultural identity of Anhui phoenix painting art?

1.3.2 What is the current status of the image composition, aesthetic characteristics and innovative applications of Anhui phoenix painting art?

1.3.3 How to establish the application paradigm of digital innovative design of Anhui Phoenix Art in the new era?

1.4 Research significance

1.4.1 This study is subdivided into the Anhui Phoenix Painting Art Phoenix Painting category of Chinese folk art. It conducts a systematic study on its historical origins, artistic value and cultural identity. It is pioneering and helps to protect and inherit Anhui. The cultural heritage of the province can be disseminated and displayed in the new era.

1.4.2 This study further explores the image composition, aesthetic characteristics and innovative application of Anhui Phoenix Art from three levels: the creative methods of Anhui Phoenix Art technology holders, the transformation forms of skill creation, and the application paths of technology inheritors. The current situation and development space of Anhui Feng Hua Art are actively sought for artistic expression language and forms that are in line with the new era, thereby promoting the further development of Anhui Feng Hua art.

1.4.3 This study is based on the new era. It is the first time to comprehensively study the theory and practice of digital innovation design from the perspective of its application paradigm. It conducts a series of digital innovation design and practice analysis on the basis of ensuring its traditional characteristics. For the same type of The research work on digital innovative design of intangible cultural heritage has guiding significance.

1.5 Definition of terms

1.5.1 Anhui Phoenix Painting Art

In this article, Anhui phoenix painting art is a genre of traditional Chinese painting art. It originated in the early Ming Dynasty and has a history of more than 600 years. It is a unique folk painting art in Anhui County, Anhui Province, China. It was selected into the Anhui Art Gallery in 2006. Provincial intangible cultural

heritage, belonging to the Folk Art category, has the reputation of "three wonders in northern Anhui".

1.5.2 New Era

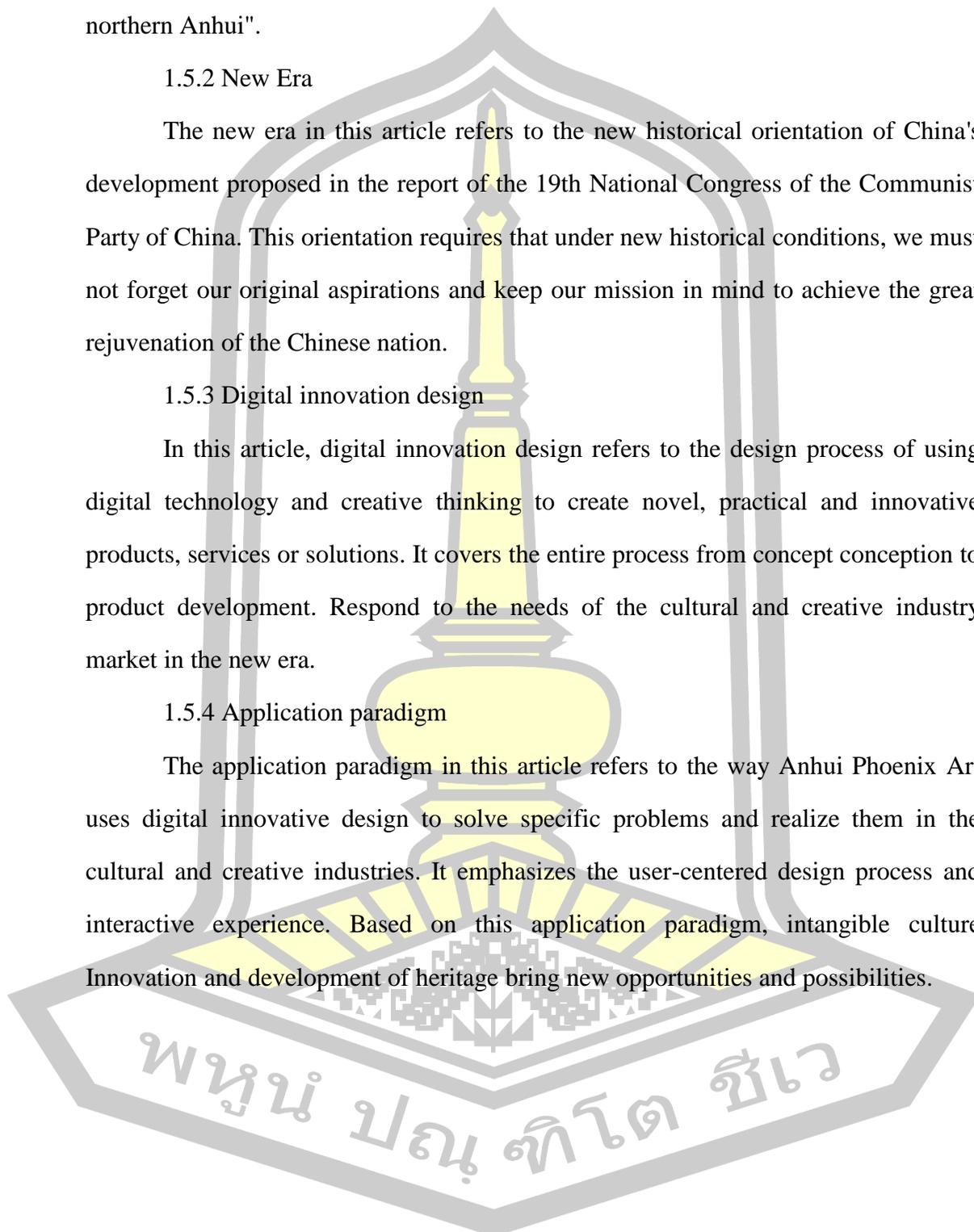
The new era in this article refers to the new historical orientation of China's development proposed in the report of the 19th National Congress of the Communist Party of China. This orientation requires that under new historical conditions, we must not forget our original aspirations and keep our mission in mind to achieve the great rejuvenation of the Chinese nation.

1.5.3 Digital innovation design

In this article, digital innovation design refers to the design process of using digital technology and creative thinking to create novel, practical and innovative products, services or solutions. It covers the entire process from concept conception to product development. Respond to the needs of the cultural and creative industry market in the new era.

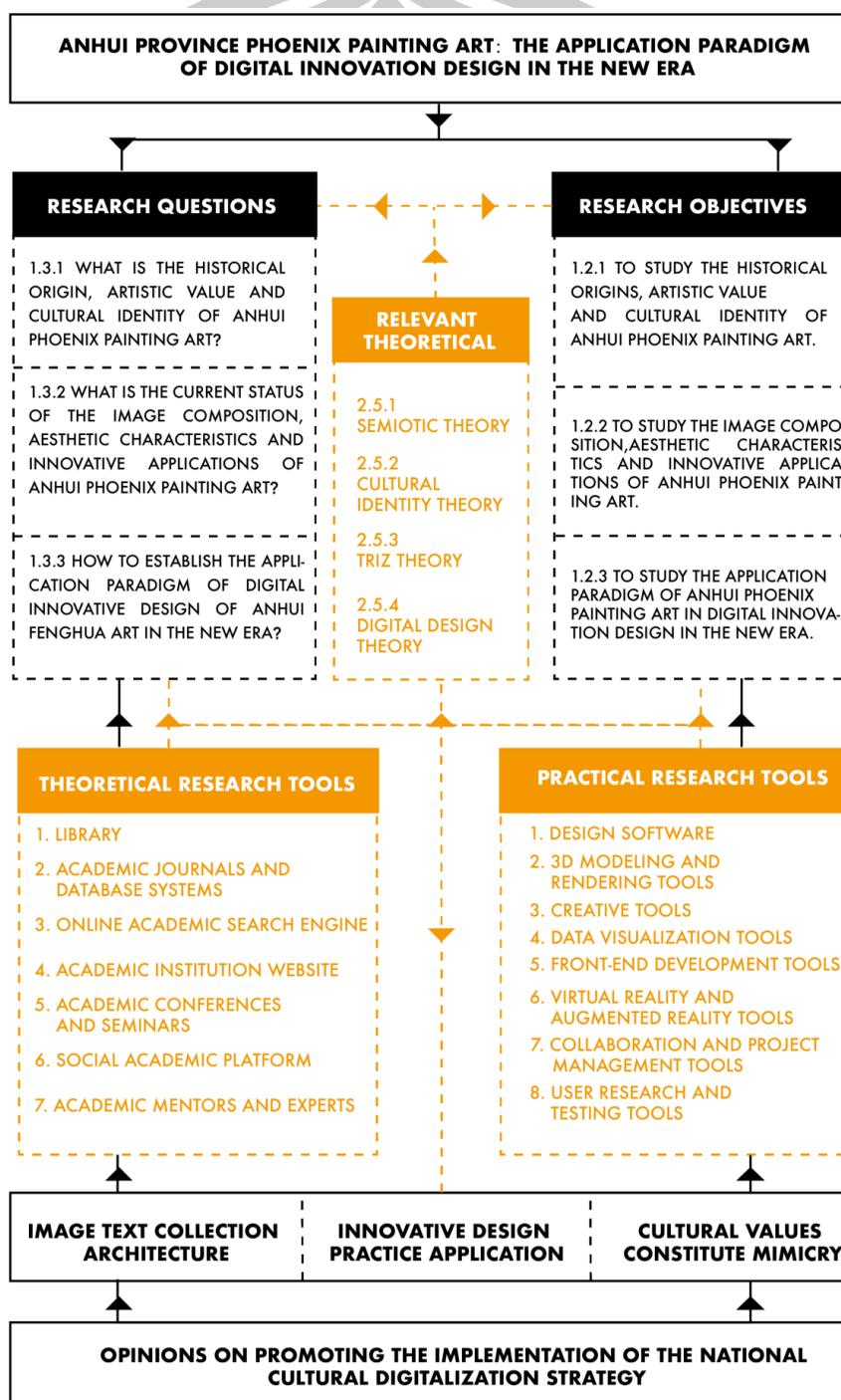
1.5.4 Application paradigm

The application paradigm in this article refers to the way Anhui Phoenix Art uses digital innovative design to solve specific problems and realize them in the cultural and creative industries. It emphasizes the user-centered design process and interactive experience. Based on this application paradigm, intangible culture Innovation and development of heritage bring new opportunities and possibilities.



1.6 Conceptual Framework

Table 1. Thesis research framework table



CHAPTER II

Literature Review

In this study, the investigators reviewed the relevant literature to obtain the most comprehensive information available in this study. The researchers reviewed the following topics:

- 2.1 Documents related to Anhui traditional art
- 2.2 Literature related to Anhui Phoenix Art Digital Innovation Design
- 2.3 Related literature on the research scope of Anhui phoenix painting art
- 2.4 Laws and policies related to Anhui phoenix painting art
- 2.5 Theories and concepts related to Anhui phoenix painting art
- 2.6 Current research status of Anhui phoenix painting art at home and abroad

2.1 Documents related to Anhui traditional art

2.1.1 Current status and practical significance of Anhui traditional art research

Anhui has beautiful mountains and rivers, well-developed water systems, beautiful scenery, unique Huizhou culture, and rich cultural heritage. Anhui itself is also one of the birthplaces of prehistoric culture and has an untouchable position in the history of Chinese culture. Anhui has not only produced many celebrities and masters in literature and history, but also has many Jianhua masters in art. Due to its special geographical environment and location, the mountainous areas in the south are rich in wood. Ancient buildings are basically made of bricks, wood, and stone. Most of the doors, windows, eaves, etc. are made of wood. These wood materials have been researched and crafted by many generations. The changes formed the very famous Huizhou wood carvings, stone carvings, root carvings, etc. In addition to these, there are many similar traditional arts in traditional art, each with distinctive characteristics and similar historical context.

Table 2. Overall framework for the construction of Digital China

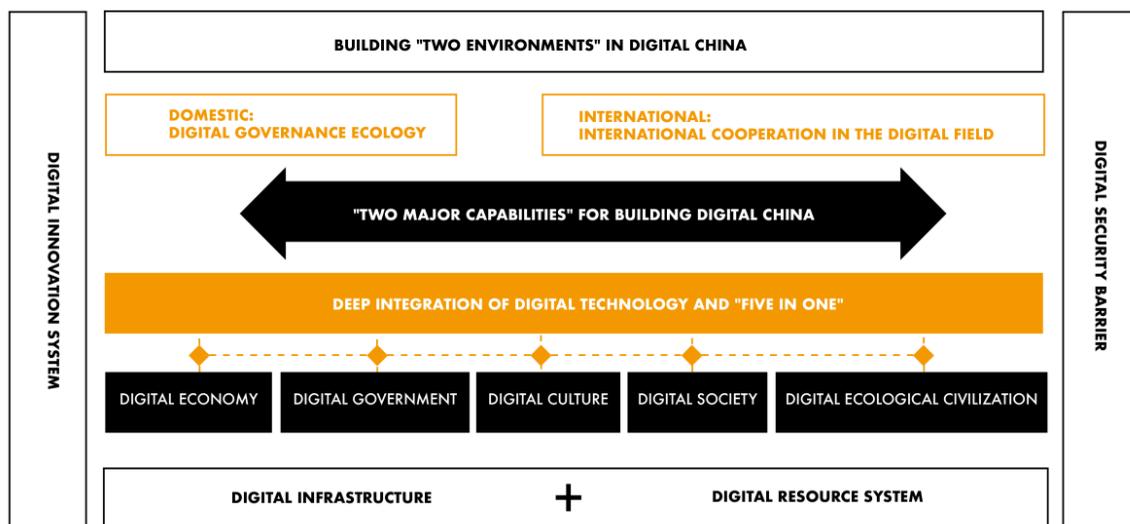


Table 3. Anhui Intangible Cultural Heritage "Traditional Fine Arts"

Anhui Intangible Cultural Heritage "Traditional Art" Provincial Project (2023)

batch	name
The fifth batch	Ink mold carving, Linhuai clay sculpture, Dabie Mountain bonsai skills, Huainan purple gold seal carving, Luzhou egg carving, Yushunxing jade carving, Gaofeng Tang style bamboo weaving, Shigong stone carving, Shang style dough sculpture, Lixin dough sculpture, Chaohu tree carving, Wannan bamboo carving, Luzhou nuclear carvings, Xikou pile wood paintings, light crimson porcelain paintings, Huizhou agarwood carvings, paper-cutting (Huizhou paper-cutting), paper-cutting (Zhang's paper-cutting), gourd pyrography (Linquan gourd pyrography), paper-cutting (Wengdun paper cutting)
The fourth batch	Huizhou wall paintings, Huizhou three sculptures (Jixi County, Xuancheng City), Huashan paper-cutting, Jingde lacquer paintings, Huaibei clay sculptures, Wannan root sculptures

The third batch	Dangshan New Year pictures, Lingbi stone carvings, bamboo weaving (Huizhou bamboo weaving) (Huangshan District, Huangshan City), paper-cutting (Hexian paper-cutting), paper-cutting (Wannan paper-cutting), Yixian painted murals
The second batch	Wushan iron calligraphy, Tianguan painting, Huizhou root carving, Huizhou bamboo carving, Yang's miniature carving, folk tie-color (Baohu District, Hefei City), folk tie-color (Hanshan County, Ma'anshan), feather painting, paper-cut (Bozhou paper-cut), Xiaoxian stone carving , gourd pyrography, bamboo weaving (Wanghe Shuxi), paper-cutting (Xiao County paper-cutting),
The first batch	Wannan bamboo carving, phoenix painting, phoenix painting, Lingbi Zhongkui painting, paper-cutting (Fuyang paper-cutting), Huizhou seal cutting, fire-stroke painting

Provincial Project

Anhui traditional art is an important part of my country's folk-art culture and the source of art forms. In recent years, due to changes in the cultural, economic and humanistic environment, and under the impact of modern Western trends of thought, the development of my country's folk art has reached a critical level. (He, 2014)

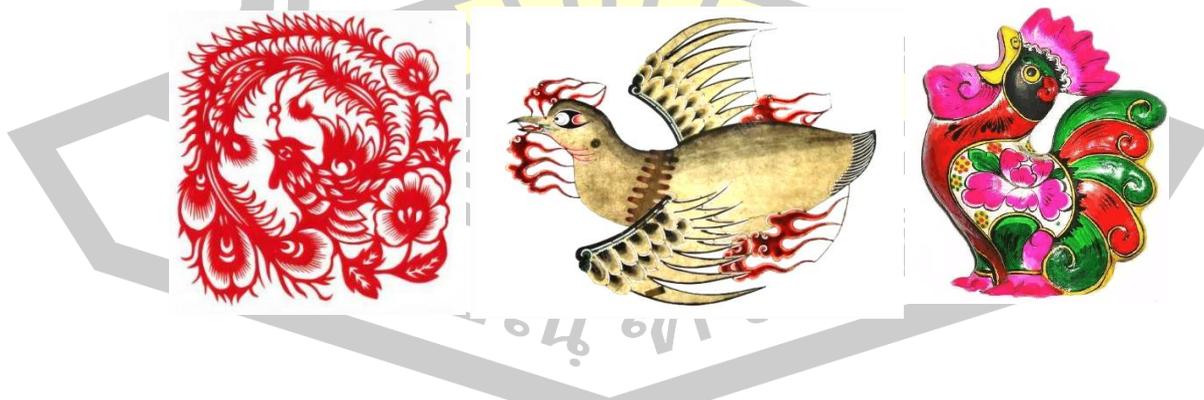


Figure 1. Chinese folk art painting forms: paper-cutting, shadow puppetry, clay sculpture

As a region with a long history and profound cultural heritage, Anhui's traditional art is not only a form of artistic expression, but also an important part of Anhui's intangible cultural heritage. Anhui traditional art is famous for its unique artistic expression and aesthetic style, including painting, sculpture, paper-cutting, ceramics and other fields. These traditional art forms have been passed down from generation to generation, embodying the wisdom and creativity of the Anhui people and becoming the unique intangible cultural heritage of the Anhui region. At the same time, Anhui's intangible cultural heritage also includes many projects related to traditional art. For example, Huizhou painting techniques, straw boat lantern making techniques, Huizhou opera performances, etc. have all been included in Anhui's intangible cultural heritage protection list. These projects inherit and display the rich artistic creation and traditional cultural connotation of Anhui region, and are of great significance to the protection and inheritance of Anhui traditional art.

The traditional art intangible cultural heritage projects in Anhui have distinctive characteristics, are highly ornamental, highly aesthetic, and have strong regional cultural characteristics. However, with the development of history and changes over time, many splendid traditional arts and intangible cultural heritage cultures are being destroyed, and some are gradually disappearing. Although "intangible cultural heritage" projects have gone through a series of historical research and tests of population culture, and have their own specificity and dissemination, their construction and dissemination are bound to be affected by the impact of foreign culture and emerging media. In order to ensure that these cultures can be passed down in the long river of history, the communication channels of these projects should also keep pace with the times. Communication activities should also be interesting, professional and then professional, and use appropriate means and methods to reflect the value of culture. location. (Li, 2021)

The emergence of Anhui traditional art is closely related to the labor production and life practices of ancient ancestors. From the design of simple utensil shapes to colorful painting, it has a long history of practice and creation. Anhui traditional art is a folk, original art form. It originated from folk life and is the creative burst of folk art. Therefore, its inheritance method also depends on life. The education method with Chinese characteristics, "teaching by words and deeds" is one of the important ways of inheriting Anhui's traditional art. With family-centered inheritance methods such as master-apprentice, father-son, etc., traditional art is mostly created by workers drawing inspiration from labor, and their creative experience is difficult to communicate through words. Therefore, most of them are oral descriptions. This inheritance method is intuitive and vivid, does not require language embellishment, appears natural and casual, and has a positive effect on inheritance.

Anhui Province has rich traditional folk cultural resources, a long history, diverse forms and strong local characteristics, and is loved by the masses. However, the current status of folk culture protection is not ideal. This is partly because the rapid development of economic structure and social transformation in various parts of Anhui in recent years has intensified the urbanization process and population mobility. At the same time, along with the introduction of a large number of foreign cultures, the living space of traditional folk culture has been squeezed. On the other hand, folk culture lacks inheritance and innovation, and the exploration and development of folk cultural heritage is insufficient, making it impossible for folk culture to reflect its due cultural, social and economic value. There is still a lot of room for improvement in the protection of folk cultural content based on existing technical forms. The inheritance of most folk cultural forms is through oral transmission between masters and apprentices, followed by text records, two-dimensional scanning, physical collections, and recordings. , taking photos and videos, etc. Restricted by various objective conditions, these methods are not

conducive to the long-term preservation and dissemination of culture, nor are they conducive to the integration and secondary development of existing resources, causing great limitations to the dissemination and protection of culture. How to protect these endangered traditional arts has become an urgent topic for governments, scholars and intangible inheritors to study. (Tao & Zhou, 2017)

Due to the impact of digital culture, Anhui traditional art has rarely entered the public eye. Although the influence of Anhui traditional art still exists in people's lives, this art form has been abandoned by the public and is regarded as a vulgar art form. People's attention to Anhui's traditional art is more out of curiosity and nostalgia, rather than out of praise, appreciation and reverence for the art itself. This also reflects a problem. There is a certain degree of disconnect between Anhui traditional art and the mainstream ideology of today's society. This situation has made it difficult to inherit Anhui's traditional art. Folk artists have a low status, are not taken seriously, and their works are not valued seriously. During this period of China's transition from agriculture to an industrial society, Anhui's traditional art has been even more discriminated against, eroded by foreign culture, and seized by imported ideas. Anhui's traditional art has been seriously threatened in China.

There are many well-known Anhui traditional art works with unique shapes scattered throughout Anhui, such as the "Huangshan Pine" of Wuhu Iron Painting and the "Sword and Horse Man" of Jieshou Painted Pottery. These regionally distinctive and exquisitely crafted arts and crafts are widely loved by consumers for their unique cultural value and caused a great sensation many years ago. However, these are all designs made many years ago. In recent years, Anhui traditional art has been difficult to produce, and there are few high-quality products that can attract attention. The entire industry is enjoying the achievements of its predecessors. At the same time, driven by economic interests, some small handicraft workshops also began to produce a large number of fakes, causing some Anhui traditional arts that had been

transformed by modern industrialization to quickly decline or even die out after experiencing short-term glory. Since most of the well-known Anhui traditional art works have relatively complicated production techniques, even authentic stores sometimes produce fakes in the face of huge market demand in order to achieve faster and more benefits. In addition to external reasons (government supervision), the main reasons are their own lack of awareness of product property rights protection and insufficient investment in product design innovation. We have even seen that various Anhui folk handicrafts can be purchased in tourist attractions across the country, but no one pays attention to the quality and authenticity of these products. This result has further allowed the prevalence of counterfeit goods. (Wang & Meng, 2013)

2.1.2 Inheritance and innovation of Anhui traditional art in the new era

Xi Jinping Thought on Literature and Art is an important part of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and provides fundamental guidance for the creation of socialist art with Chinese characteristics in the new era. General Secretary Xi Jinping pointed out in the report of the 19th National Congress of the Communist Party of China: "Socialist literature and art is the literature and art of the people. We must adhere to the people-centered creative orientation and carry out literary and artistic creation that is worthy of the times while going deep into life and taking root in the people." Art is the people's literature and art. Plastic arts that meet the people's spiritual and cultural needs are an important part of China's socialist literary and artistic undertakings and an important carrier of cultivating socialist core values. At a major historical juncture when socialism with Chinese characteristics enters a new era, the emergence of Xi Jinping's literary and artistic ideological system provides a program of action and ideological guidance for the prosperity and development of socialist art with Chinese characteristics in the new era. (Wang, 2018)

With the advent of the new era, the inheritance and development of Anhui's traditional art must use new media as the basis to truly promote the traditional art culture. In Anhui's traditional art culture, art works mainly rely on physical objects such as paper, stone or cloth. The combination of new era art and new media art can display art works in digital form. Digitalization is the basis for the development of art in the new era. In traditional art works, graphics and pictures are static. The application of new media art can make traditional art works dynamic and achieve direct interaction between the audience and the art works. Among the many categories of artistic expression in Anhui, art is very close to the lives of the public. The combination of art works and new media art can effectively inherit and develop traditional art culture. The combination of art works and new media art is an ingenious process. During the actual combination process, creators need to retain the traditional art culture contained in the art works, and also need to make the art works modern and present a new style to the public. The art form not only shows the true characteristics of traditional art culture, but also makes traditional art works glow with new vitality, and can be inherited and carried forward.

Chinese traditional art culture has been further inherited. By analyzing the development and changes of Chinese traditional art culture and the new era of art, it can be seen that using Chinese traditional art culture as a creative element and combining it with the science and technology of the new era to create new art works is the only way for the development of art in the new era. This can not only improve people's aesthetic ability and awareness of traditional art, but also truly play a role in inheriting and promoting art culture. (Li & Hu, 2023)

Anhui traditional art contains rich Anhui elements and has strong national characteristics. It not only has the aesthetics and practicality of art works, but also has rich cultural heritage. In the context of the new era, the development of Anhui's traditional art needs to be combined with science and technology, combining

traditional art expressions with modern technology or instruments, so that traditional art works can be inherited and innovated, and more artistic works can be presented, making Traditional art culture has walked out of showcases and exhibition halls and entered the lives of the people.

2.1.3 Anhui traditional art digital development and application paradigm

The inheritance and development of traditional fine arts intangible cultural heritage has received more and more attention, and the development of digital technology has provided the possibility to carry out innovative expressions of traditional fine arts intangible cultural heritage. As far as traditional art intangible cultural heritage is concerned, the so-called digital innovative expression is a design practice that uses digital technology to innovatively express it. In design practice, we must pay attention to principles such as culture, innovation, and practicality. At the same time, in terms of expression forms, attention should be paid to digital two-dimensional expression, digital three-dimensional expression, and digital dynamic image expression. Using digital means to innovatively express traditional art intangible cultural heritage projects can, on the one hand, enhance its development vitality, and on the other hand, effectively expand its development space. At the same time, the visual elements and cultural symbols of traditional art intangible cultural heritage projects can be better integrated into the contemporary aesthetic system and integrated into daily life, thereby expanding the effectiveness of public culture in serving the public and allowing more general public to further understand, pay attention to, recognize and accept folk art. treasures, so as to better pass them on. (Yang, 2019)

The digital dissemination of intangible cultural heritage is the product of the organic combination of digital media and digital technology. Digital media not only has the storability and accessibility of print media, but also has the freshness and

timeliness of electronic media. It also has its own graphic and text reading capabilities and audio-visual capabilities.

At present, there are two main models for the digital protection of intangible cultural heritage: the first is the collection, preservation, and storage of digital information about intangible cultural heritage; the second is the establishment of relevant databases and models based on digital information. With the rapid development of digital technology and the continuous expansion of its application scope, these two protection models have been unable to meet people's needs for the protection of intangible cultural heritage. By exploring and applying digital technology, integrating intangible cultural heritage into modern life can not only bring traditional art into line with the current era, but also enhance its popularity and influence, allowing it to be inherited and developed in the digital age, thereby realizing the role of traditional art in contemporary times. Innovation and development in society. (Li & Zhao, 2023)

The material form of intangible cultural heritage can be restored into a shareable and renewable digital form through digital collection, storage, processing, display, dissemination and other technologies, generating a simulated environment and forming an interactive three-dimensional dynamic vision with meta-information integration. and systematic simulation of entity behavior to preserve intangible cultural heritage permanently. (Liu & Han, 2021)

With the development of the Internet and digital display technology, many digital "intangible cultural heritage" products are integrated on the digital folk culture display system, and intelligent terminal applications and Internet technology are used to create online folk culture display platforms, such as the developed digital folk culture museum The system can be applied to PC and mobile terminals. Through network interconnection, the database resources in the network of intangible cultural heritage centers in various places are continuously enriched into the online display

platform of traditional art resources. This will lower the threshold for people to acquire traditional art knowledge, expand the dissemination and audience of folk culture, maximize resource sharing, and promote traditional art on a larger scale.

In the context of the new era, digitalization and the various intelligent development directions derived from it have become the main trend. Under the guidance of this trend, various new technologies have been extended. Such technologies have gradually become the core strength of various industries and are increasingly playing a significant role. Key role. Implement digital strategic decisions, actively use the power of emerging technologies, and combine visualization technology to establish a modern transformation mechanism for traditional art; activate the inherent vitality of intangible cultural heritage and breakthrough in an entertainment way; rely on various network media to promote the networking of intangible cultural heritage; cross-border and various Integrate fields to promote the multi-dimensionalities of intangible cultural heritage; expand new offline forms to achieve the extension of intangible cultural heritage, thereby achieving innovative development of intangible cultural heritage.

2.2 Literature related to Anhui Phoenix Art Digital Innovation Design

2.2.1 The conceptual definition and development process of Anhui phoenix painting art

Phoenix painting is a unique folk painting art in Anhui, Anhui Province, also known as "dragon and phoenix painting". Phoenix painting has a very long history. It originated in the Ming Dynasty and flourished in the Qing Dynasty. It has a history of more than 600 years. As early as 2006, Anhui Phoenix Painting became one of the first batch of intangible cultural heritages in Anhui Province and is well-known at home and abroad. (Sun, 2020)

According to "Anhui Ancient and Modern" records, in the second year after he became emperor (AD 1368), Zhu Yuanzhang issued an edict to name his hometown "Anhui" and decided to build the central capital in Anhui. He mobilized various skilled craftsmen across the country and carried out approximately Six years of large-scale construction employed more than one million migrant workers. In 1375, the construction of Zhongdu was stopped and the capital was established in Nanjing. During this period, a legend was spread: In the year of Anhui, a large colorful bird suddenly flew from the sky with extremely gorgeous feathers, just like the phoenix, the divine bird described in the legend. It hovered over Anhui, alarming the whole city. The common people and the government circled over Anhui Mansion for several times and then flew south. They flew for more than ten miles and disappeared. As the saying goes, "The phoenix never lands in a land without treasures." So the prefect of Anhui sent people to dig at the place where the phoenix landed. During the digging, there was a strong wind and heavy rain. Later, it was discovered that Zhu Yuanzhang's mother was buried here, so he was buried on the spot. The cover formed the later Ming Emperor's Mausoleum. Among the people, this story has become more and more magical. It is said that the burial of Zhu Yuanzhang's mother was "the phoenix tapped the acupuncture points and the county magistrate dug the pit". When the people in the city were watching the colorful phoenix, one of the painters painted the image of the phoenix and presented it to Zhu Yuanzhang and Empress Ma, which was praised by them. After this painting spread among the people, it was also loved by the people and gradually evolved into "Phoenix Painting". After the appearance of phoenix paintings, Zhu Yuanzhang and his queen Ma invited folk painters to the palace to paint phoenix paintings every year and festival, and posted them everywhere to pray for happiness and wealth. After that, phoenix paintings evolved and developed several times and became the only one in Anhui. Some traditional folk arts continue to this day. (Wang, 2014)

The origins of Anhui Phoenix Paintings recorded in various documents are somewhat different, and are mainly based on legends. Among them, there is a relatively true statement. Although there is no specific research, it is more credible than the legends. When Zhu Yuan Zhang recruited skilled craftsmen to build the imperial palace in Anhui, many of them were highly skilled carvers and painters. The art of phoenix painting is considered to be the decorative painting of early palace buildings. It was painted on pillars, arch edges of tomb walls, and caissons to create a sense of splendor and nobility. After Zhu Yuan Zhang established Nanjing as his capital, many of these carving and painting artists did not go to Nanjing for various reasons but settled in Anhui. They had no other source of livelihood. In order to make a living, they had to rely on their own carving and painting skills to create dragon and phoenix patterns. From carving and painting on buildings to painting on paper for sale, it was later passed down, processed and improved by several generations of artists to form the phoenix painting art of Anhui Province.

After Zhu Yuanzhang stopped building the central capital, he withdrew a large number of craftsmen, but also left a group of artists behind. This was an important foundation for the development of Anhui painting among the people. The Guangxu period of the Qing Dynasty was the heyday of phoenix paintings. At that time, people would put up phoenix paintings on weddings, festivals and other festive days for good luck. Phoenix paintings were also loved by many court officials and were once brought into the capital as tribute.

During the Republic of China, there were dozens of painting shops. Anhui Fudong Street was known as Phoenix Street and there were many phoenix painting artists. After the July 7th Incident, Anhui fell. The Japanese looted Anhui, and Anhui painting artists fled everywhere. After that, there were only two Phoenix shops left in Anhui, Hua and Yin, and the development of Phoenix was in trouble.

After liberation, the artist surnamed Yin passed away, and his son Yin Jiecheng also moved to Xuehua Township in the western suburbs of Bengbu, stopped painting, and died in a nursing home. So far, Anhui Phoenix is the only family with Chinese surname left. Hua Xianrong, the eldest son of the Hua family, continued to open a shop selling phoenix paintings in Anhui and supported the store alone. Hua had two apprentices - Li Fengming and Wang Dexin. During the early liberation, the government vigorously supported Anhui phoenix paintings, represented by Li Fengming and Hua Xianrong. Many folk phoenix painting artists came to Beijing to show their skills and painted together with the famous national painters Wu Zuoren and Li Kuchan at that time, which improved the artistic realm of Anhui phoenix painting.

With the outbreak of the "Cultural Revolution" and the catastrophe of ten years, many precious paintings were lost. Li Fengming and Hua Xianrong died one after another, and Wang Dexin was forced to switch to selling vegetables to make a living. The second son Hua Rongsheng lived in Sichuan. Since then, Anhui phoenix paintings have almost disappeared.

In 1983, the Second Secretary of Anhui County was very supportive of cultural work. With the joint efforts of Anhui Phoenix artist Wu Dechun and many cultural workers, Anhui County Art Association was established, with Wu Dechun as the person in charge. The two key tasks after the establishment of the association are to depict the new look of Anhui and to excavate and save Anhui Phoenix paintings.

With the efforts of Mr. Wu Dechun, Wang Dexin, one of Fahrenheit's disciples, was finally invited to teach phoenix painting, and the Anhui phoenix painting exhibition was held that year. The next year, under the leadership and support of the Chuzhou Regional Cultural Bureau and the Anhui Provincial Mass Art Museum, the exhibited phoenix paintings were compiled into a book "Anhui Phoenix Paintings" and published. The title was inscribed by Wu Zuoren, chairman of the

China Artists Association. On this basis, non-governmental organizations such as Anhui County Phoenix Painting Research Institute, Anhui County Zhongshan Phoenix Painting Academy, and China Anhui Phoenix Painting Academy were established. Due to some objective reasons, they failed to persist and existed in name only. However, Phoenix painting artists continued to create.

On January 10, 2009, Anhui County Anhui Phoenix Painting Research Association was established, and a Anhui Phoenix Painting special exhibition was held in Hefei, Anhui Province. This was the first time since liberation that Anhui Phoenix Painting went out of the county as a team and shocked the whole country. Province. On September 8, 2009, Chuzhou Anhui Phoenix Painting Exhibition was held. On December 12, the Anhui Phoenix Painting Exhibition was held at the Songjiang District Cultural Center in Shanghai. In December 2011, a phoenix painting exhibition was held at the Nanjing Battle of Crossing the River Victory Memorial Art Museum, which received an enthusiastic response. Anhui phoenix painting has made great progress and has cultivated a large number of young phoenix painting artists. Local universities in Chuzhou are also actively taking phoenix painting as an important part of art teaching and conducting special lectures and elective courses on phoenix painting. These have effectively promoted the development of Anhui Phoenix Painting.

2.2.2 The aesthetic image and value recognition of Anhui phoenix painting art

In the creation of phoenix paintings, the generation of image aesthetics is caused by the interaction between "meaning" and "image", which requires the joint participation of the creative subject and the appreciating subject. In this process, "meaning" and "image" have a dialectically unified relationship. "meaning" is internal and subjective, while "image" is external and objective. The two complement each other and are indispensable.

Anhui Phoenix Painting is an artistic product of farming civilization and Ming culture. It has a strong sense of nature worship and totem consciousness, and is a perfect combination of practicality and aesthetics. It clearly reflects the simple and straightforward cultural characteristics of Anhui people, and represents Anhui people's continuous pursuit of beauty. Anhui Phoenix Painting was produced and developed under such historical origin and cultural background, and has the simple character of the people in the Huaibei River Basin and the local characteristics of local art. Anhui Phoenix Painting, one of Anhui's intangible cultural heritages, on the one hand prominently conveys local customs and customs, and on the other hand greatly enriches the art of Chinese folk painting and becomes a treasure of Chinese folk culture and art. In the process of human civilization, we understand traditional culture through Anhui Phoenix Painting itself. While inheriting the cultural essence of Anhui Phoenix Painting, we must also study the concepts, mentality and artistic characteristics formed by it, and continuously integrate it into it. New contemporary elements allow Anhui Phoenix Painting to form a vibrant new artistic style under the new social normal. (Cao Peiqin, 2016)

The expressive language of Anhui Phoenix Painting is very distinctive. By managing and creating according to the way of thinking of imagery in aspects such as composition, shape, technique and subject matter, it has formed a unique artistic style that can arouse people's inner resonance. From this aspect, the expressive language of Anhui Phoenix Painting is highly imagistic, able to express the creator's yearning for a better life, and is closely intertwined with the emotions of the local people, reflecting the aesthetics of people in a specific region. Ideals and spiritual pursuits form distinct aesthetic characteristics of imagery. Therefore, the aesthetic image of Anhui Phoenix Painting is typical, unique and rich, and it is a mirror of Chinese culture and national emotions. This requires us to continuously study traditional culture in depth, use imagery thinking as the guiding principle for creation, and on the basis of inheriting the

tradition of phoenix painting, actively seek artistic expression languages and forms that are in line with contemporary times, thereby promoting the further development of Anhui phoenix painting. (Chen, 2021)

2.2.3 Anhui Phoenix Art Digital Innovation Design Application Paradigm

The integration of traditional art projects and digital innovative design has become an important trend in cultural development. The introduction of digital innovative design expands the horizons of traditional art projects and gives them new forms, connotations and missions. Cross-integration of Anhui Phoenix Painting and traditional art projects, on the one hand, through target detection algorithm for data collection, established a pattern library of Anhui Phoenix Painting, and applied style transfer algorithm to provide an exploration approach for the inheritance and innovation of intangible cultural heritage patterns, and for The digital protection and inheritance of phoenix paintings provides a more complete solution and expands the innovative design possibilities of phoenix paintings. On the other hand, combined with the digital creation platform, an efficient communication bridge is established between intangible cultural heritage and the public, meeting the user's experience, entertainment and creative needs. The development of digital innovative design can quickly generate a variety of patterns and provide rich design materials, thus providing more convenience for the innovative development of phoenix paintings. In addition, the study of Anhui Phoenix Painting with the help of digital innovative design also provides valuable inspiration for the development of other traditional techniques. This approach to integrating innovation is expected to promote the prosperity of traditional fine arts projects.

Digital technology can make the production of Anhui phoenix painting art more efficient. Traditional Anhui phoenix painting art production requires a lot of time and energy, but digital technology can quickly achieve production through computers and digital equipment. Computers can process large amounts of data quickly, significantly reducing production time. The opportunities digital technology brings to the inheritance

and development of Anhui phoenix painting art are obvious. While making the production of Anhui phoenix painting art more convenient, it can also help Anhui phoenix painting art to be better inherited and developed. Traditional velvet flower production requires the use of traditional dyes and materials, and digital technology can reduce the impact on the environment and better protect traditional culture. Digital technology can be used to record the production process of Anhui phoenix painting art, and each step can be automatically controlled through computer programs, thereby improving production efficiency and quality. At the same time, digital technology can also help Anhui Phoenix art better meet market demand and adapt to consumer preferences, thereby better inheriting and developing it. The application of computers, digital equipment, environmentally friendly materials, etc. can better protect traditional culture and craftsmanship, thereby promoting cultural inheritance and development. The development of new media technology has added more expression techniques to the art production process of Anhui Phoenix, enhancing people's sense of experience and improving the appreciation of the works. Through the animation simulation of the production process of Anhui Phoenix art, the audience can understand the production process at a glance; using VR (virtual reality) technology allows the audience to immersively experience the production process of Anhui Phoenix art and enhance the viewing experience; using AR (augmented reality) Realistic) technology can combine Anhui phoenix painting art with various props and scenes to make the work richer and more three-dimensional. In addition, relevant personnel can also use digital technology to apply Anhui phoenix painting art to other fields and expand its scope of application.

Under the perspective of "Internet +", huge digital changes have taken place in all walks of life and promoted the evolution of the social real economy. Relying on the Internet, digital information technology, big data analysis, AI intelligence, cloud computing and other digital means, we can break the shackles of the inheritance of Anhui Phoenix art, pioneer and innovate the expression of Anhui Phoenix art, and

provide new opportunities for the inheritance and development of porcelain inlay art. At present, digitization is an effective way to carry out practical and dynamic protection and inheritance of local culture, traditional residential buildings, folk customs, etc. (Lin, 2023)

2.3 Scope of research on Anhui phoenix painting art

2.3.1 Types of artistic themes of Anhui phoenix paintings

Anhui phoenix painting art has unique themes and specifications. The main themes include: Danfeng Chaoyang, Dragon and Phoenix Showing Auspiciousness, Belt Going to Court, Hundreds of Birds Facing Phoenix, Five Phoenix Tower, Qilin Phoenix, Hundreds of Birds Offering Longevity, and Four Fan Screens.

2.3.1.1 Danfeng Chaoyang

As shown in the picture below (2) Danfeng Chaoyang is the most widely circulated auspicious pattern in Anhui phoenix painting art. It consists of a gorgeous phoenix in the shape of a golden rooster, with its head raised towards a red sun. It is equipped with mountain rocks, auspicious clouds and peonies. Peonies are the richest flowers. The peonies in phoenix paintings have nine leaves, which is very particular. The sun symbolizes light and nurtures all things, and the phoenix symbolizes the benevolent monarch and his ministers. The first is a metaphor for talented people who encounter good opportunities and can fully display their talents to make achievements and serve the country; the second is a metaphor for the wise and benevolent monarch, the peace and prosperity of the country and the people; the third is a metaphor for the people's life to be as warm and beautiful as the rising sun. The level rises like the rising sun.



Figure 2. Phoenix painting "Danfeng Chaoyang"

2.3.1.2 Dragon and Phoenix appear auspicious

As shown in the picture below (3) The dragon and phoenix are in auspicious shape. The dragon is flying in the clouds and mist. The dragon spits out wishful beads. The phoenix is hovering next to the dragon. The dragon and phoenix are jubilant, chasing and playing. The so-called dragon and phoenix among people is a metaphor for the heroes among people. The dragon represents a man and the phoenix represents a woman. The auspiciousness of the dragon and the phoenix also often refers to the mutual love and happy love between husband and wife. Phoenix paintings with dragon and phoenix themes are often used during weddings to express best wishes to newlyweds.



Figure 3. Phoenix painting "Dragon and Phoenix Presenting Auspiciousness"

2.3.1.3 Tape upward

As shown in the picture below a big phoenix and a small phoenix are flying back to their nest (chao). The big phoenix looks back and calls to the little phoenix, and the little phoenix spreads its wings in response. "Chao" and "cao" have the same pronunciation. First, it is a metaphor for the family happiness between father and son; second, it is a metaphor for the honor of the father and the nobleness of the son, and the father and son's desire to serve as officials together.



Figure 4. Feng Hua's work "Belt to the Court"

2.3.1.4 Hundreds of birds paying homage to the phoenix

As shown in the picture below () A phoenix is in the middle of a hundred birds facing the phoenix, showing the proud posture of the king of birds. The phoenix is surrounded by 50 pairs of 100 rare birds such as cranes, parrots, mynas, peacocks, and mandarin ducks. Take sycamore trees, landscapes, auspicious clouds, etc. The phoenix is the king of birds, which is a metaphor for a benevolent monarch to whom all birds submit. This is a bird metaphor for people. First, it hopes that the monarch of the current dynasty can be kind and loving to the people, and bring peace, freedom, prosperity and happy life to the people; second, it is a metaphor for the character and prestige of a highly respected person.



Figure 5. Phoenix painting "Hundred Birds Paying Attention to the Phoenix"

2.3.1.5 Wufeng Tower

As shown in the picture below, the phoenix in the Five Phoenix Tower has four commonly used shapes: "flying, singing, eating, and lodging". There is a big phoenix in the center, surrounded by four small phoenixes. The one on the left is looking for food, which corresponds to the food in the shape. The one on the right is resting, which corresponds to the Su in the shape. The two above are flying and playing, which correspond to the flying and singing in the shape. Equipped with balconies, railings, mountains, auspicious clouds, etc. The big phoenix symbolizes parents, and the small phoenix symbolizes children. Parents and children play, expressing the traditional Chinese concept of having many children and bringing happiness and the people's yearning for family happiness and a happy life.



Figure 6. Phoenix painting "Five Phoenix Tower"

2.3.1.6 Qiling feng

The phoenix among unicorns and phoenixes are flying and chasing next to the unicorn. The unicorn is soaring in the clouds and riding in the mist, and the scene is lively and joyful. The phoenix is the king of birds, and the unicorn is the king of beasts. It expresses the ambition to be unwilling to be mediocre and pursue becoming a king. It is a metaphor for the lofty ambition to become a phoenix among people.



Figure 7. Phoenix painting "Qilin Phoenix"

2.3.1.7 Four screens

The four screens show the various images of the phoenix flying, singing, sleeping, and eating throughout the day. The different shapes of the four phoenixes are painted to correspond to the four seasons of spring, summer, autumn, and winter. The spring is matched with the peony and purple swallow. In summer, it is paired with lotus mandarin ducks, in autumn with golden chrysanthemums and oriole, in winter with winter plums and magpies, and some with plums, orchids, bamboos and chrysanthemums.



Figure 8. Phoenix painting work "Four Screens"

2.3.2 Anhui Phoenix Painting Art Pattern

As shown in the picture below (9) Anhui phoenix painting art uses "phoenix" as the main pattern, but it is very different from other phoenix paintings. Over 600 years since the birth of phoenix painting, through the continuous improvement and innovation of folk artists of all generations, Anhui phoenix painting has continued to develop and gradually formed its own unique model and style: the phoenixes in Anhui phoenix painting are snake heads and turtle backs, nine tails, eighteen wings, as well as an eagle's beak, chicken feet, goatee, and wishful crown. Only when these are satisfied when drawing, can it be regarded as an authentic Anhui phoenix painting.

ANHUI PROVINCE PHOENIX PAINTING ART PATTERN DECOMPOSITION COMPOSITION DIAGRAM

安徽省凤画艺术图案模式分解构成图

ANHUI PROVINCE PHOENIX PAINTING ART PATTERN DECOMPOSITION COMPOSITION DIAGRAM. ANHUI PROVINCE PHOENIX PAINTING ART PATTERN DECOMPOSITION COMPOSITION DIAGRAM. ANHUI PROVINCE PHOENIX PAINTING ART PATTERN DECOMPOSITION COMPOSITION DIAGRAM.

安徽省凤画艺术以“凤”为主体元素，借鉴其他凤画图案... 凤画艺术以“凤”为主体元素，借鉴其他凤画图案... 凤画艺术以“凤”为主体元素，借鉴其他凤画图案...

1 PHOENIX PAINTINGS 凤画作品



2 PHOENIX SUBJECT 凤画主体



3 BODY ELEMENT 主体元素



4 AUXILIARY ELEMENTS 辅助元素



Figure 9. Anhui Province Phoenix Painting Art Pattern

Decomposition Composition Figure

Anhui's phoenix painting art has a unique formula for phoenix shape, which is different from other phoenix paintings and is unique in the country. This is also why it

is valuable. The main phoenix has various shapes, vivid and natural. In addition to the main subject "phoenix", Anhui phoenix paintings also have certain particularities and meanings in the background patterns. The main traditional backgrounds include: the dragon symbolizing heaven, the auspicious beast unicorn symbolizing auspiciousness, the peony symbolizing wealth and auspiciousness, and the The blazing sun of hope, plum blossoms, orchids, pine and bamboo symbolizing the breeze and pride, the vast sea symbolizing Liaoyuan, and the mountains and rocks symbolizing strength and hardness, etc. Different themes and meanings are combined with different background patterns, which is extremely exquisite.

2.3.2.1 Snakehead

The "snake head" in the art of Anhui phoenix paintings is related to the background of the formation of phoenix paintings. Historical research has shown that Zhu Yuanzhang was a dragon, and the legendary Queen Ma of Zhu Yuanzhang was a small dragon, that is, a snake. Snake heads are also a common element in phoenix paintings in Anhui County, Anhui Province. The snake head usually appears on the body of the phoenix, as an important part of the image of the phoenix's head.

Snake heads are often depicted as curled in phoenix paintings, showing the unique agility and softness of snakes. It represents the source of life and the power of change, forming a unique contrast and balance with the complex and changeable patterns on the Phoenix. In Anhui phoenix painting art, snake heads can symbolize wisdom, spirituality and mystery. As one of the mythical animals in ancient culture, snakes have been endowed with magical symbolic meanings. The design of the snake head makes the image of the phoenix more mysterious and charming, enhancing the overall artistic effect of the work. At the same time, the depiction of the snake head should also focus on its integration and coordination with the body of the phoenix. Through precise control of lines and shapes, the artists blended the snake head and the

body of the phoenix, forming a unique artistic expression that showcases the magic and vitality of the phoenix.

In short, the snake head in Anhui phoenix paintings is part of its unique charm. The depiction of the snake head makes the image of the phoenix more vivid and artistic. The mystery and wisdom represented by the snake head enriches the cultural connotation of Anhui Phoenix Painting and gives the work a unique visual impact and artistic value.

2.3.2.2 Turtle back

In the phoenix paintings of Anhui County, Anhui Province, the turtle's back is one of the important elements. Phoenix paintings usually take the phoenix as the theme, and the body parts of the phoenix, especially the back, are often depicted in the image of a turtle's back.

Turtle back refers to the special pattern on the back of the phoenix's body. It originates from the totem animal in ancient Chinese myths and legends - the turtle, and is a symbolic expression of the texture of the turtle shell. The turtle shell has distinct layers and rich textures, adding a unique pattern and texture to the Phoenix's back. In Anhui phoenix paintings, the depiction of the turtle's back pays attention to both the accurate reproduction of texture and the processing of light and shadow to highlight the body and three-dimensionality of the phoenix. As a feature of the Phoenix's body, the turtle's back plays a role in enriching and supplementing the overall composition in Phoenix paintings, making the work more vivid and layered. In addition, the turtle's back also has a certain symbolic meaning in Anhui Phoenix paintings. The turtle is considered a symbol of longevity, stability and good luck and plays an important role in Chinese culture. The use of the turtle's back makes the image of the phoenix more meaningful, representing the phoenix's nobility, auspiciousness and longevity.

All in all, the turtle's back in Anhui phoenix paintings is an important element of the image of the phoenix, adding unique patterns and texture to the work. Through the depiction of the turtle's back and its symbolic meaning, Anhui phoenix paintings present unique artistic charm, enriching the ornamental value and cultural connotation of phoenix paintings.

2.3.2.3 Nine tails and eighteen wings

The "nine tails and eighteen wings" in Anhui phoenix painting art represent the eighteen counties of Kyushu under the jurisdiction of Anhui Prefecture during the Ming Dynasty. In addition, in traditional Chinese culture, "nine" is the largest number and an auspicious number, representing the supreme power. Among the nine tails, there are three main tail feathers in the middle, which are longer, colorful and elegant in shape. There are three secondary tail feathers on both sides, which are consistent with the main tail feathers, but shorter and more free in color. They do not necessarily have to be similar to the main tail feathers, but the colors of the secondary tail feathers on both sides must be consistent with each other. Eighteen wings, each wing is composed of nine wings, and the left and right wings form a pair, for a total of eighteen wings.

In the phoenix paintings of Anhui County, Anhui Province, nine tails and eighteen wings are important elements. Phoenix paintings usually take the phoenix as the theme, and the tail and wings of the phoenix are often depicted with the image of nine tails and eighteen wings. Nine tails refer to the special texture of a phoenix's tail, often depicted as consisting of nine curved tail feathers. These nine tails have the characteristics of distinct layers and graceful lines, adding a sense of elegance and dynamics to the tail of the phoenix. The eighteen wings refer to the wings spread out on both sides of the phoenix, which are usually depicted as nine pairs of independent wings, totaling eighteen. Through the processing of light and shadow, these eighteen

wings highlight the layering and three-dimensionality of the phoenix wings, making the work more vivid and shocking.

As an important part of the Phoenix body, the nine tails and eighteen wings play a role in enriching and supplementing the overall composition in Anhui Phoenix paintings. They make the image of the Phoenix more gorgeous and solemn, and create a mysterious and noble atmosphere. Nine tails and eighteen wings also have certain symbolic meanings in Anhui phoenix paintings. Nine is an auspicious number in ancient Chinese culture, representing longevity and symbolizing perfection; eighteen has the connotation of wealth and blessing. The use of nine tails and eighteen wings makes the image of the phoenix more auspicious and auspicious, representing the nobility, glory and auspiciousness of the phoenix.

All in all, the nine tails and eighteen wings in Anhui phoenix paintings are important elements of the phoenix image, making the work more gorgeous, mysterious and solemn. Through the depiction and symbolic meaning of nine tails and eighteen wings, Anhui phoenix paintings present unique artistic charm and enrich the ornamental value and cultural connotation of phoenix paintings.

2.3.2.4 Olecranon

In the phoenix paintings of Anhui County, Anhui Province, the eagle's beak is one of the important elements. Phoenix paintings usually take the phoenix as the theme, and the head part of the phoenix, especially the mouth, is often depicted with an eagle's beak.

The eagle's beak refers to the shape of the beak on the head of the phoenix. Compared with the pointed beak of ordinary birds, the eagle's beak is usually sharper, showing a strong sense of sharpness and vitality. In Anhui phoenix paintings, the eagle's beak is often regarded as one of the prominent features of the phoenix, reflecting the majestic and majestic image of the phoenix. In addition, the eagle's beak also conveys a symbolic meaning. The phoenix is an auspicious totem in ancient

Chinese culture, often symbolizing glory, strength, sublimity and rebirth. The design of the eagle's beak increases the shock and dynamics of the image of the phoenix, making the phoenix more unique in visual impact and awe-inspiring temperament. In the creation of phoenix paintings, artists grasp the shape and proportion of the eagle's beak and use lines to make the phoenix's mouth more vivid and three-dimensional, which increases the artistic expression and ornamental value of the phoenix paintings.

The depiction of the eagle's beak in Anhui Phoenix Painting is not only a technique of artistic creation, but also one of the important elements of the deep subject matter and rich connotation of Anhui Phoenix Painting. With its unique shape and symbolic meaning, it presents the unique cultural charm and artistic style of Anhui Phoenix to people.

2.3.2.5 Chicken feet

In the phoenix painting art of Anhui Province, chicken feet are one of the characteristic elements. Phoenix paintings usually feature the phoenix as a theme, and the phoenix's feet, or chicken feet, are often depicted as a unique form. In paintings, chicken feet often have curved, powerful, and fine lines that highlight the phoenix's sense of strength and flexibility. Their detailed depictions are often exquisite, making the image of the phoenix more vivid and three-dimensional. Chicken feet also have a certain symbolic meaning in phoenix paintings. In Chinese culture, the chicken is closely associated with the phoenix. As a derivative totem of the Phoenix, the chicken is often regarded as one of the symbols of the Phoenix in a symbolic sense. The depiction of chicken feet in phoenix paintings represents the phoenix's lineage and identity, highlighting the phoenix's unique status and sense of sanctity.

In addition, the depiction of chicken feet should also pay attention to its coordination with the body of the phoenix and the balance of the overall composition. Craftsmen usually accurately grasp the bending degree and position of the chicken feet to blend the chicken feet and the body of the phoenix to form a harmonious

artistic expression. In the phoenix paintings in Anhui, chicken feet are an important part of the image of the phoenix, adding to the artistic features and uniqueness of the works, and enriching the ornamental value and cultural connotation of the phoenix paintings.

2.3.2.6 Ruyiguan

In the phoenix painting art of Anhui Province, the wishful crown is one of the common elements. Phoenix paintings usually feature the phoenix, and the ornament on the phoenix's head, the wishful crown, is often depicted in colorful forms. Ruyi crown is a kind of headwear in traditional Chinese culture, which symbolizes good luck and good wishes. In Anhui phoenix paintings, Ruyi crowns are often depicted as the top decoration on the phoenix's head. They are displayed with exquisite details such as curves, patterns and jewelry, highlighting the nobility and respect of the phoenix.

The shape of the Ruyi crown is often flat, curved and layered. The use of gold, red and other bright colors adds a gorgeous and majestic atmosphere to the phoenix's head. They are often decorated with gems, beads, feathers and other ornaments, making the overall image more exquisite and resplendent. Ruyi crown also has certain symbolic meaning. The Ruyi crown symbolizes power and wealth. In the depiction of the Phoenix's head, the Ruyi crown conveys this symbolic meaning to the image of the Phoenix, highlighting the Phoenix's dignity, glory and authority.

All in all, in Anhui phoenix paintings, the Ruyi crown is an important element of the image of the phoenix, which enriches the artistic expression and ornamental value of the work. Through the depiction and symbolic meaning of the Ruyi crown, Anhui Phoenix paintings present unique cultural charm and artistic style.

2.3.2.7 Goatee

In the phoenix painting art of Anhui Province, goatee is one of the common elements. Phoenix paintings often feature the phoenix, and the phoenix's facial features, the goatee, are often depicted as a unique form.

The goatee refers to the long goatee-like beard on the lower jaw of the Phoenix's face, which is usually depicted as slender and slanted lines, forming a dynamic and flowing image. The goatee not only adds texture to the phoenix's head, but also makes its image more vivid and three-dimensional. The goatee also has a certain symbolic meaning in Anhui Feng paintings. In Chinese culture, goats are considered a symbol of wealth and luck. The use of goatee makes the image of the phoenix more a symbol of wealth and auspiciousness, representing the wealth and good luck of the phoenix. In addition, the description of the goatee should also pay attention to its coordination with the Phoenix's face and the balance of the overall composition. Through the smoothness of lines and the grasp of form, the artist blends the goatee with other facial features to form a harmonious artistic expression.

In short, in Anhui phoenix paintings, goatee is an important part of the image of the phoenix, adding unique charm and characteristics to the work. Through the depiction and symbolic meaning of goatee, Anhui Phoenix Painting presents unique artistic charm and enriches the ornamental value and cultural connotation of the work.

2.4 Laws and policies related to Anhui phoenix painting art

On February 14, 2012, the "Guiding Opinions of the Ministry of Culture on Strengthening the Productive Protection of Intangible Cultural Heritage" stated: "The productive protection of intangible cultural heritage refers to the maintenance of intangible cultural heritage in the practice process of a productive nature. With authenticity, integrity and inheritance as the core, and the effective inheritance of

intangible cultural heritage skills as the premise, it is a protection method that transforms intangible cultural heritage and its resources into cultural products with the help of production, circulation, sales and other means.

In July 2017, the "Ministry of Culture's Guiding Opinions on Promoting the Innovative Development of the Digital Cultural Industry" issued by the state stated: "Implement digital content innovation and development projects, encourage the digital transformation and development of cultural resources such as intangible cultural heritage, and achieve excellent The creative transformation and innovative development of traditional culture." By using artificial intelligence technology to identify image features, intelligent protection of intangible cultural heritage can be achieved. At the same time, using artificial intelligence and big data analysis, people can select audiences in a targeted manner and accurately disseminate intangible cultural heritage content, thereby enriching the expression of cultural information and making the presentation of culture more diverse. At present, there are many unexplored areas in the related research fields of applying artificial intelligence technology and computer technology to Anhui Phoenix.

In the "Internet + Chinese Civilization" Three-Year Action Plan, it is emphasized that the development of digital resources on the Internet needs to be integrated with the inheritance and innovative development of traditional Chinese culture, focusing on the multi-angle, multi-dimensional and in-depth exploration of the value of cultural relics, and promoting the digitization of cultural relics. Innovate and develop, and strengthen the connection between cultural relics and cultural consumption industries. The "14th Five-Year Plan for Cultural Relics Protection and Scientific and Technological Innovation" aims to adhere to scientific and technological innovation, further promote the reform and utilization of cultural relics, optimize resource allocation, and build a pattern of deep integration of industry, academia, and research, so as to promote my country's transformation from a cultural

relics country to a cultural power. The "Opinions on Promoting the Implementation of the National Cultural Digitalization Strategy" issued in 2022 will help the future digital development of intangible cultural relics.

The "Opinions on Further Strengthening the Protection of Intangible Cultural Heritage" issued by the General Office of the CPC Central Committee and the General Office of the State Council, and the "Implementation Plan for the Inheritance and Development Project of Intangible Cultural Heritage" jointly issued by the Propaganda Department of the CPC Central Committee, the Ministry of Culture and Tourism, and the Ministry of Finance, The "14th Five-Year Plan for the Protection of Intangible Cultural Heritage" issued by the Ministry of Culture and Tourism clearly states that it is necessary to strengthen the construction of intangible cultural heritage echelons, expand the training channels for intangible cultural heritage talents, promote the combination of traditional inheritance methods and modern education systems, and innovate The method of cultivating intangible genetic inheritors continues to strengthen the team of intangible cultural inheritors and provides talent support for the education of the awareness of the Chinese nation's community.

On October 27, 2023, the Political Bureau of the CPC Central Committee conducted the ninth collective study session on building a strong sense of community for the Chinese nation. General Secretary Xi Jinping pointed out when presiding over the study that "it is the common task of the entire Party and people of all ethnic groups to build a strong sense of community for the Chinese nation and promote the high-quality development of the Party's ethnic work in the new era." General Secretary Xi Jinping emphasized: "Implement the inheritance and development project of China's excellent traditional culture, study and excavate the excellent genes and contemporary value of Chinese traditional culture, promote the creative transformation and innovative development of China's excellent traditional culture, prosper and develop advanced socialist culture, build and apply The expression

system of Chinese cultural characteristics, Chinese national spirit, and Chinese national image has continuously enhanced the Chinese cultural identity of people of all ethnic groups.”

2.5 Theories and concepts related to Anhui phoenix painting art

2.5.1 Semiotic theory

Art symbols are art forms that express human emotions or meanings through artistic images. The artistic image of phoenix paintings has the unique artistic symbol language of the folk in northern Huizhou. In its expression, it mainly uses two types of modeling symbols and color symbols, using folk art language to express the wealth of royal art.

Anhui Phoenix painting is very different from other folk arts. It has certain requirements on painting skills. Generally speaking, folk art can create works if they have a certain passion for life and public aesthetics, but Anhui Phoenix Painting requires a certain foundation in painting, so it has high requirements on the personal qualities of the creator.

Anhui phoenix painting is a folk painting art that uses the totem "phoenix" as the main depiction object. The shape of the "phoenix" in Anhui phoenix paintings has been changed from the traditional chicken head to a snake head. The totalized product of the snake is "dragon". Thinking according to this symbolism (that is, using a form as a customary representation of a concept), the changed snake head adds a sense of imperial power to Anhui Phoenix paintings. There are nine phoenix tail feathers in the Anhui phoenix painting. In ancient times, "nine" was the extreme number of the yang number. It was the largest odd number and was mostly associated with emperors. However, the traditional phoenix only had three. Anhui phoenix paintings are unique in being created around the theme of phoenix. The main themes include hundreds of birds paying homage to the phoenix, hundreds of birds offering longevity, dragons

and phoenixes presenting auspiciousness, and red phoenixes rising to the sun. Each theme contains a large number of auspicious patterns with beautiful meanings. In the modeling concept of Anhui phoenix paintings, the traditional symbol "phoenix" is repeatedly used. This is not because they are uncreative, but to express the hidden symbolic meaning through repeated symbols. This is a recognition of phoenix culture and also to meet the needs of folk etiquette and festivals.

Anhui phoenix paintings contain rich meanings. The patterns, colors and other visual symbols of various phoenix paintings integrate the subjective emotions of folk artists and convey the creator's exquisite conception, rich emotions and beautiful wishes. Therefore, the aesthetic connotation of phoenix paintings is not only reflected in the sensory rendering of formal representations, but also in the allegorical communication of imagery-level symbols, which has the characteristics of iconography, symbolism, and relativity.

Taking "Hundred Birds Worshipping the Phoenix" as an example to analyze the shape of Anhui phoenix painting. The picture is centered on the colorful phoenix on the left. The phoenix has a graceful and stretched posture, raising its head to the sun, looking proud of the king of birds. The birds are in different moods and all face the direction of the phoenix. They are distributed among flowers, trees, rocks and the sky. Together with peonies, sycamore trees, *Ganoderma lucidum*, strange rocks and the red sun, they form a vivid animation of "a hundred birds facing the phoenix". In this painting, the phoenix has nine tail feathers in total. The three main tail feathers account for two-thirds of the body. The shape is elegant, and there are three secondary tail feathers on each side. The soft and fluffy feathers have the same style as the main tail feathers. The lines are smooth and not rigid. There are overlapping and turning changes in the arrangement and combination of feathers. The phoenix is surrounded by fifty pairs, a total of one hundred rare birds. The mandarin duck symbolizes mutual love and happy love between husband and wife; the crane symbolizes longevity and

longevity; the peacock symbolizes good fortune, good fortune and happiness; the parrot symbolizes heroic appearance and longevity... The whole design is based on the symbol Birds are a metaphor for people. Hundreds of birds submit to the phoenix, and hundreds of officials and people submit to a monarch who can be kind and caring for the people. It can also be a metaphor for a person with high moral character and high respect.

In the background, slender and smooth lines outline the delicate features of the peony petals. The leaves and veins are strong and powerful, which not only depicts the texture of the leaves, but also shows the swaying movement of the breeze. The peony flower symbolizes blooming flowers, wealth and perfection, and is also a symbol of the spirit and excellent character of the Chinese nation. The sycamore tree is full of vitality, and the hardness and rough texture of the trunk are vividly displayed. Artistic techniques such as precise lines with varying thicknesses and brush strokes with alternate dyes are fully reflected in the paintings. Wutong symbolizes noble and beautiful character in ancient poetry, and is also a symbol of loyal love. The embellished auspicious symbol, *Ganoderma lucidum*, is placed in the foreground to visually stabilize the figure of the phoenix. The peonies on the lower right are surrounded by a strange stone dyed in bluestone green, with pairs of birds perching on it, bringing visual enjoyment. These scenes are all bathed in sunshine, living freely on the beautiful land, and outline a warm scene. The selection of scenery follows the modeling concept of Chinese folk art, emphasizing the subjective expression of spirit, giving people an aesthetic appeal of good fortune, happiness, and prosperity.

Image symbols are constructed by simulating objects or resembling objects. For example, the "phoenix" in the painting is a virtual image made by people through simplification, refinement, collage, and generalization of reality. Although it cannot be found to be completely consistent with the reality of the object, it still embodies its characteristics. People have certain intuitions about such symbols. Sex, through the

similarity of shapes, we can recognize the object and understand its auspicious and eternal meaning. There is no necessary connection between the symbol and the object it refers to. It is the result of convention. The objects and related meanings it refer to are not formed by a single individual, but by a collective consciousness formed by long-term feelings, that is, a certain social custom. For example, peonies, chrysanthemums, plum blossoms, etc. all imply wealth and a beautiful, joyful and happy life. Anhui phoenix paintings fully embody the symbolic nature of symbols, and their symbolic codes contain commonly used expression methods in folk customs: homophony and understanding of objects. Homophony refers to the use of semantic puns and homophonic borrowings to express auspicious themes. For example, the image of the chicken itself is not beautiful, but because "chicken" and "auspicious" are homophones, the chicken's beak and chicken feet in the phoenix painting are symbols of auspiciousness; The homophonic pronunciation of "Rong", "Tang" and "Tang" has given rise to the symbols of "prosperity, wealth and honor" and "full house of wealth and honor". Referring to objects means connecting people's feelings about certain things with their good wishes, using certain animals and plants and other beautiful things to express the pursuit of beautiful ideals in the form of indirect metaphors.

The "phoenix" in phoenix paintings is regarded by the Chinese as a sacred bird and the protector of people. People draw phoenixes in pictures, which means beauty and peace, and symbolizes perfection, auspiciousness and light. As the king of birds, the phoenix itself has a strong symbolic meaning, and when combined with other symbolic objects such as the dragon in the sky, the wealthy peony, the auspicious beast unicorn, etc., the picture is joyful, festive, and auspicious. , the meaning of peace. In terms of color, it is related to gold, wood, water, fire and earth in traditional culture. Gold represents gold, green represents wood, black represents water, red represents fire and yellow represents earth. This method of expression, which uses

metaphorical meaning from objects or expresses emotions by sending objects, integrates objects, emotions, meanings and interests into one, giving viewers rich imagination space and long-lasting aftertaste, which is implicit and beautiful.

The iconographic and symbolic nature of Anhui phoenix paintings is not clear-cut and static, and the distinction between the characteristics of symbols has a certain degree of relativity. For example, "dragon and phoenix" are an image symbol in terms of the virtual nature of the symbol to the object; when "dragon and phoenix" are symbols of the Chinese nation, and when we claim to be the descendants of dragon and phoenix, they are symbolic symbols. There is a progressive development relationship between iconography and symbolism. In the process of symbol evolution, there has been a gradual separation between the medium and the referent, making the combination of symbols increasingly complex. There is an overlapping or similar relationship between image symbols and objects; while there is an agreed relationship between symbolic symbols and objects. The artistic charm of Anhui Phoenix Painting is not only reflected in its composition and shape, but more importantly, in its carrying and dissemination of local folk culture, and its role in cultivating folk aesthetic consciousness in folk culture. Practical and spiritual roles.

2.5.2 Cultural identity theory

The advancement of science and technology and the process of globalization have given new meaning to the time and space where people live, and also provided a new paradigm for people's lives. But at the same time, it also dissolves the routines and traditions that provide people with a sense of security. As a result, people's lifestyles and even ways of thinking have undergone drastic changes. Intangible inheritance under the current new framework is a reflective practice. In recent years, the practice of protecting and inheriting intangible cultural heritage has achieved certain results, but the problem of misaligned identity cannot be ignored. During this period, research related to intangible cultural heritage mainly focused on the

construction and reflection of the theoretical system of intangible cultural heritage (2007-2009), the cultivation of intangible cultural heritage inheritors (2009 to the present), and the industrial development and utilization of intangible cultural heritage (2008 to the present).) and the digital protection of intangible cultural heritage (2008 to present), and most of the positions and views held are based on the industrialization of intangible cultural heritage to a certain extent, and even attribute the problems that arise in the inheritance of intangible cultural heritage to " The degree of industrialization is insufficient." (Xu & Chen, 2018)

The core of the inheritance of intangible cultural heritage is culture. "The most important psychological factor in culture is identity, and identity is the bridge between culture and personality." "Different identities have different results: different self-identities form different people, and different cultural identities also form different cultural forms and endow different cultural natures." The culture emphasized in the protection and inheritance of intangible cultural heritage is different from the consumer culture that follows market operation rules, industrial development requirements and attempts to put the audience in the trap of consumerism. It is a value judgment that comes from the heart and has a relatively firm stance. It is recognized that it needs to be applied to social life and production and operations in various industries to help achieve cultural confidence and national self-confidence. However, judging from the activities and evaluation standards currently occupying a considerable proportion in the name of intangible cultural heritage, almost all of them are not based on cultural identity, but on the basis of consumerism. In the long run, it is not conducive to intangible cultural heritage. sustainable development of heritage. (Hu, 2023)

As a multi-ethnic country, in the context of the rapid development of the globalization process, it is necessary to explore the development of a multi-ethnic country based on the premise of uniting and building a Chinese national cultural

community, inheriting and carrying forward the culture of various ethnic minorities, and building a Chinese national cultural community. the way. Promoting the innovative expression of Chinese culture through the path of cultural identity and refining innovative design methods for national cultural and creative products based on cultural identity can provide reference for the creation of other national cultural and creative products. (Wu & Wang, 2024)

Culture is the soul of a nation and the core of the national spirit. Chinese cultural identity is the deepest and most basic identity of the Chinese nation. Multi-ethnic cultural identity is realized and demonstrated precisely through the culture that all ethnic groups can share. Intangible cultural heritage is the most intuitive external behavioral representation of cultural identity. The intangible cultural heritage formed by various ethnic groups in my country through long-term exchanges, exchanges and integration is the embodiment of historical memory and collective consciousness in the formation and development of the Chinese national community. This kind of co-creation and sharing the intangible inheritance of empathy can connect members of all ethnic groups to trace their collective memories and enhance the people's sense of cultural identity in the spiritual realm. It is the psychological basis for realizing that "all ethnic groups are one family" and is a powerful ideological substrate for promoting and solidifying the consciousness of the Chinese nation's community. Intangible cultural heritage can help enhance the national pride and cultural self-confidence of members of the Chinese nation community, and help promote the Chinese nation to become a community with a shared future with higher recognition and stronger cohesion. (Huang & Cheng, 2024)

Chinese cultural identity is the cultural foundation for solidifying the consciousness of the Chinese nation's community. The intangible cultural heritage of all ethnic groups contains the cultural genes that solidify the consciousness of the Chinese nation's community. It forms the ideological matrix that solidifies the

consciousness of the Chinese nation's community. It is the basis for solidifying the consciousness of the Chinese nation's community. Valuable resources. The main ways to use the intangible cultural heritage of all ethnic groups to build a strong sense of the Chinese nation's community include: respecting and protecting the intangible cultural heritage of different ethnic groups to lay an emotional foundation for building a strong sense of the Chinese nation's community; strengthening theoretical research on the intangible cultural heritage of all ethnic groups to provide Lay an ideological foundation for building a strong sense of community for the Chinese nation; promote innovation in the intangible cultural heritage of all ethnic groups and provide material support for building a strong sense of community for the Chinese nation.

2.5.3 TRIZ theory

TRIZ theory was founded in 1946 by the former Soviet inventor Enrich Saltcellar (G. S. Saltcellar). TRIZ was introduced to Western countries in the mid-1980s and quickly attracted great attention in the world's product development field, especially in the fields of quality engineering, product development and management. (Guo & Wu, 2007)

TRIZ provides a set of systematic theories, methods and tools, which is of great significance for innovative design. (Li, Di & Wei, 2007)

In 2008, the Ministry of Science and Technology of the People's Republic of China, the National Development and Reform Commission, the Ministry of Education, and the China Association for Science and Technology jointly issued the "Several Opinions on Strengthening Innovative Methodology", officially introducing TRIZ theory into China. Under the leadership of the Ministry of Science and Technology, the Innovation Methods Research Association was established to build an exchange platform for management departments, enterprises, universities and scientific research institutes in the field of innovative methods, strengthen the work of innovative methods, enhance the public's innovative thinking and innovative spirit

cultivation, and promote the scientific awareness of all sectors of society. The research and application of methods and scientific tools can enhance the innovation capabilities of enterprises and promote my country's independent innovation from the source. (Jiao, Huang & Mao, 2022)

At present, TRIZ theory has developed into a mature theory and method system to serve technological innovation, and has established a series of universal tools (system evolution rules, 40 invention principles and contradiction matrices, object-field model analysis algorithms and 76 invention problems (standard solution, etc.), which provides a systematic method tool for creatively discovering and solving problems. It is widely used in the field of engineering technology and gradually penetrates and expands into other fields. (Yang, 2021)

As a systematic innovation method, TRIZ covers multiple core concepts and methods, including contradiction identification, 40 invention principles, conception of the ideal final result (IFR), application of the innovation matrix, and feature and defect analysis, attention to technology development trends, distinction between mandatory and non-mandatory functions, and problem modeling. TRIZ treats problems as contradictions and encourages designers to use universal inventive principles to resolve these contradictions while simultaneously applying IFR thinking to envision perfect solutions. By emphasizing reducing non-mandatory functionality, analyzing technology trends, and modeling abstract problems, TRIZ provides a powerful tool for solving complex problems and driving innovation across a wide range of domains. TRIZ's body of knowledge can be organized in a variety of classifications. From a functional perspective, TRIZ encompasses innovation methods such as technical conflict resolution, application of inventive principles, and design of ideal end results, which build a mental framework for problem solving and innovative design. In addition, TRIZ includes a series of innovative principles, such as “non-diminishing and enhancing” and “the principle of opposition,” to guide designers’

thinking and actions. Depending on the type of problem, TRIZ also provides a variety of analysis tools, including conflict matrix, technical conflict analysis, and functional analysis, for problem diagnosis and resolution. (Yan & Li, 2024)

The application fields of TRIZ are diverse, including product design (such as product functional innovation, conceptual design and design optimization), industrial design (improving product functionality and aesthetics), service design (improving service processes and improving user experience and efficiency), Digital intelligent product design, and green innovative design (solving environmental protection and sustainability issues). Depending on the type of problem being solved, TRIZ can be applied to technical conflict resolution, inventive problem solving, and problem analysis. TRIZ's approach to knowledge organization includes building a TRIZ knowledge base that enables designers to more easily access and apply this knowledge, while providing practical examples to demonstrate how real design problems are solved and successfully applied in different fields. Furthermore, the applications of TRIZ can be divided into primary and advanced applications, depending on the complexity of the methods and tools, to address different levels of design problems and inventive innovation challenges. These multi-level classification methods form TRIZ's comprehensive and flexible knowledge system, providing strong support for solving various design challenges. (Yan & Li, 2024)

2.5.4 Digital Design Theory

In folk art, digital technology plays the role of the person who collects and uses information. When implemented, relevant permission must be obtained to continue, and the collected digital data information must be used reasonably at the appropriate time if it involves commercial nature. Yes, it must be permitted by relevant laws. (Zhou, 2012)

Through the research on the digital protection and development of Anhui Phoenix paintings, it can be seen that it is feasible for local folk art to seek new forms

and new development paths through new thinking, new technologies and new methods. However, in the process of digital protection and development, it is necessary to Pay attention to some issues. (Wang, 2013)

In the digital research and practice of phoenix paintings, image features can be analyzed and sorted through AI technology. AI technology can greatly improve the speed of image analysis and pattern extraction. This is not only conducive to the digital preservation and management of phoenix paintings, but also conducive to the research, study, and dissemination of phoenix paintings. Through target detection technology, the phoenix painting patterns can be extracted and entered into the pattern database. This eliminates the need for a large amount of manual repetitive work and achieves efficient digital collection of phoenix painting patterns. (Zhang & Gao, 2023)

As scientific and technological means continue to mature, digitalization and the various intelligent development directions derived from it have become the main trend in the current era. Under the guidance of this trend, various new technologies have been developed, and these technologies have gradually become the mainstay of various industries. core strength and increasingly plays a significant key role. Implement digital strategic decisions, actively use the power of emerging technologies, and combine with visualization technology to establish a modern transformation mechanism for intangible cultural heritage; activate the inherent vitality of intangible cultural heritage and breakthrough in an entertainment way; rely on various network media to promote the networking of intangible cultural heritage; cross-border and various The integration of fields will promote the multi-depersonalization of intangible cultural heritage; expand new offline forms to achieve the extension of intangible cultural heritage, thereby achieving innovative development of intangible cultural heritage. Innovate the process design, production process, production methods and dissemination methods of intangible cultural

heritage to achieve a dynamic transformation of intangible cultural heritage protection. Use the power of emerging science and technology to break the limitations of time and space, diversify cultural communication methods, broaden new ideas for the transformation of intangible cultural heritage, creatively create visualization, entertainment, multi-dimensionality, and extension of intangible cultural heritage, promote the innovative transformation of intangible cultural heritage values, and give full play to the intangible cultural heritage The unique role of culture in economic and social development. By analyzing and studying the value, characteristics and manifestations of intangible cultural heritage, a lot of important information can be discovered. In the protection of intangible cultural heritage, people can process and apply digital technology to achieve the purposes of publicizing intangible cultural heritage, promoting intangible cultural heritage, and inheriting and developing intangible cultural heritage. (Weng, Qipao, & Kong, 2023)

The rapid development of Internet information technology has brought new development opportunities to the innovative inheritance of phoenix paintings. The intervention of digital media has opened up a new path for the preservation of phoenix paintings. Therefore, the local area should actively use digital media to inherit and innovate phoenix paintings, and develop them in a longer-term and more efficient manner based on high-quality protection of phoenix paintings. On the one hand, relevant persons in charge and inheritors should be innovative, proactively learn digital media technology, and learn and recognize the important role of digital media in the preservation of phoenix paintings in their daily work. In this process, relevant institutions can also organize special training or learning and exchange activities to provide convenient ways for relevant personnel to improve their digital media literacy; or they can improve the structure of the team of inheritors of phoenix painting art by introducing professional talents to improve their digital media comprehensive level, in order to promote the smooth development of innovative

inheritance and efficient protection of phoenix paintings. On the other hand, in the specific practice process, relevant personnel should use the method of image collection to copy the painting skills of phoenix paintings. They can restore the painting process by shooting high-definition documentaries; organize and summarize the collected phoenix paintings of different schools. The creators, types of phoenix paintings, etc. are retained and complete images are established and a database is established to disseminate the phoenix paintings through the Internet and other media, so that the public can have a deeper understanding of the phoenix paintings. During this process, relevant personnel should pay attention to the protection of phoenix painting-related materials and carry out preservation work under safe supervision and a harmonious digital media environment to avoid unnecessary losses caused by damage to phoenix painting materials and their cultural value. This in turn affects the inheritance of phoenix paintings. (Chen, 2023)

2.6 Current research status of Anhui phoenix painting art at home and abroad

2.6.1 Research on digital protection of intangible cultural heritage

This work was carried out earlier abroad and achieved certain research results, such as the digital protection project established by the University of Oz in Japan for the lion dance, a living cultural heritage in the Oz region of Japan, and the cooperation between UNESCO and Samsung Electronics Co., Ltd. of South Korea. Partnership, Samsung intends to use its corporate resources and network for cultural diversity, especially research on the protection of world intangible cultural heritage.

As far as China is concerned, the digital protection of intangible cultural heritage started relatively late. Zhejiang University's "Research on Key Technologies for Digital Rescue, Protection and Development of Folk Performing Arts", Zhejiang University School of Computer Science's "Research on Digital Technology of Chu Cultural Chime Music and Dance", Research work on projects such as "Digital Aided

Design System for Yunnan Bornite Handicrafts" has achieved some substantial results. Domestic research on the digital protection of intangible cultural heritage has formed a relatively comprehensive theory. Vertically, in 2006, some scholars already proposed that digital protection is a new means of protecting intangible cultural heritage, focusing on analyzing the current status of digital protection of tangible and intangible cultural heritage at home and abroad and the digital technologies used. Taking the "Research and Development of Digital Protection Technology for Intangible Cultural Heritage" project jointly conducted by the Chinese Folk Art Institute of Shandong Academy of Arts and Crafts and the School of Computer Science of Zhejiang University as an example, the project includes digital cultural heritage promotional CDs, virtual multimedia display systems, and paper-cut patterns. A number of research results, including the auxiliary creation and design system, provide clear cases for the digital protection of intangible cultural heritage. In 2009, a scholar carefully explained the concept of digital protection of intangible cultural heritage and analyzed existing digital technologies, such as digital photography, digital scanning, virtual reality, databases, etc. He proposed to establish a digital resource library to enable experts and enthusiasts to make it easier to understand cultural content, the feasibility of establishing a resource library was analyzed and corresponding modules were divided. However, it needs to be made clear that digital protection is not limited to the establishment of resource libraries. Although this study provides a good theoretical foundation for the convenience of resource library establishment, it is not comprehensive and cannot fully represent the relevant content of digital protection.

In 2011, some scholars launched a relatively comprehensive study on intangible cultural heritage protection strategies based on digital technology. After analyzing the shortcomings of traditional protection methods, they proposed a series of digital protection strategies: establishing a digital resource library, establishing a

digital museum, and Narrative, computer animation and virtual reality simulation of intangible cultural heritage, etc. This research broadens the concept of digital protection but does not provide in-depth theoretical and practical research on the implementation of each protection strategy. In 2012, some scholars added the keyword "development" after the protection of intangible cultural heritage, broadened the scope of digital application, and macroscopically explained the digital collection and storage technology, digital restoration and reproduction technology, and digital display and dissemination. The role of digital technology represented by technology, virtual reality technology, etc. in the protection and development of intangible cultural heritage was deeply excavated and analyzed, and the problems and principles encountered in digital protection and development were also put forward. This research is relatively in-depth, but its shortcoming is that it focuses on technical research and ignores the artistic value and cultural connotation of the research ontology.

In summary, most research on the digital protection and development of intangible cultural heritage starts from a macro and conceptual direction, and most of the strategies proposed focus on the establishment of resource libraries and digital museums. It focuses on the construction of digital technology framework and its feasibility research, ignoring the artistic characteristics, artistic value and cultural connotation of intangible cultural heritage itself. It is too general and rigid, and the digital protection and development methods proposed in the research are only purely theoretical. research without conducting more in-depth practical research.

From a horizontal perspective, most research on digital protection and development is carried out on the broad concept of "intangible cultural heritage", and only a few have conducted detailed classification research. For example, in the 2009 exploration of digital construction for the protection and inheritance of folk paper-cutting art in Hebei, a digital multimedia interactive system was built based on the

pattern and craft characteristics of paper-cutting, which comprehensively demonstrated a digital protection framework that conforms to the characteristics of paper-cutting art. However, for each module in the framework the specific implementation has not been explained in more depth. In 2011, some scholars took Dai brocade as an example to study the digital protection of this intangible cultural heritage. In view of the complex technological process of Dai brocade, they proposed the creation of 3D animation to vividly display traditional patterns and technological processes in the form of animation. In 2012, the research on the digital protection and regeneration of Fuzhou shadow puppets proposed the extraction of shape, color, material, and style characteristics based on the characteristics of shadow puppets and established a database and symbol library. This was then carried out in the fields of animation, art design, and stage design. Promote and apply, establish digital museums and online game platforms, so that shadow puppets can be regenerated and developed well.

2.6.2 Research on Anhui Phoenix Painting

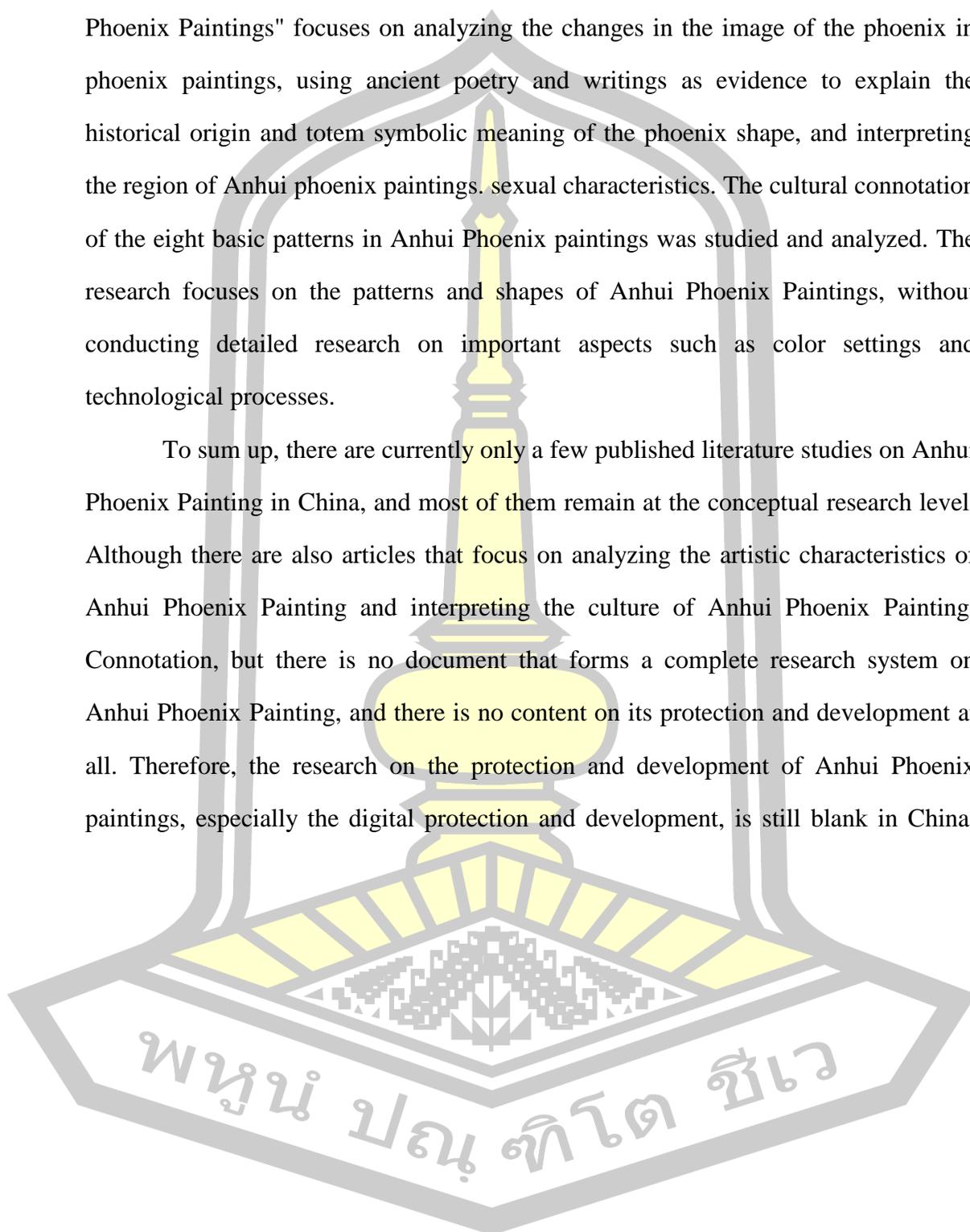
In terms of folk-art categories, certain results have been achieved in the protection and inheritance of paper-cut art. In addition, digital research on the same types of Yangliuqing woodblock New Year pictures and Suzhou Taohuawu woodblock New Year pictures is also underway. But as an outstanding representative of Chinese folk art, Anhui Phoenix Painting has not received corresponding attention. There are very few studies on the essence of Anhui Phoenix Painting. Mark Yun's "Anhui Phoenix Painting" provides a popular science introduction to the origin, painting rules and three expression techniques of Anhui Phoenix Painting. Focusing on the elaboration of the historical development process of phoenix painting, there is no more in-depth study of its artistic characteristics, cultural connotation, etc. His "A Brief Analysis of Anhui Folk Phoenix Painting Art" introduced the origin and development of Anhui Phoenix Painting and gave a brief overview of the shape, color

and technical characteristics of Anhui Phoenix Painting, but it still stayed at the level of theoretical science popularization. Later, some scholars interpreted the cultural connotation of Anhui Phoenix Painting, researched and analyzed the historical and cultural evolution and spiritual cultural connotation of Anhui Phoenix Painting, and fully demonstrated the inherent spiritual value contained in Anhui Phoenix Painting. This is the first time that Anhui Phoenix Painting has been studied and interpreted as a culture, with a unique perspective. Some scholars have also studied the characteristics of the decorative symbols of Anhui Phoenix paintings. By analyzing the shape, color and other elements of Anhui Phoenix paintings, they have extracted its unique decorative symbol characteristics and built a framework for further interpretation of the artistic characteristics of Anhui Phoenix paintings. In addition, "On the Characteristics and Cultural Connotation of Anhui Phoenix Paintings" focuses on analyzing the changes in the image of the phoenix in phoenix paintings, using ancient poetry and writings as evidence to explain the historical origin and totem symbolic meaning of the phoenix shape, and interpreting the region of Anhui phoenix paintings. The cultural connotation of the eight basic patterns in Anhui Phoenix paintings was studied and analyzed. The research focuses on the patterns and shapes of Anhui Phoenix Paintings, without conducting detailed research on important aspects such as color settings and technological processes.

To sum up, there are currently only a few published literature studies on Anhui Phoenix Painting in China, and most of them remain at the conceptual research level. Although there are also articles that focus on analyzing the artistic characteristics of Anhui Phoenix Painting and interpreting the culture of Anhui Phoenix Painting. Connotation, but there is no document that forms a complete research system on Anhui Phoenix Painting, and there is no content on its protection and development at all. Therefore, the research on the protection and development of Anhui Phoenix paintings, especially the digital protection and development, is still blank in China.

In addition, "On the Characteristics and Cultural Connotation of Anhui Phoenix Paintings" focuses on analyzing the changes in the image of the phoenix in phoenix paintings, using ancient poetry and writings as evidence to explain the historical origin and totem symbolic meaning of the phoenix shape, and interpreting the region of Anhui phoenix paintings. sexual characteristics. The cultural connotation of the eight basic patterns in Anhui Phoenix paintings was studied and analyzed. The research focuses on the patterns and shapes of Anhui Phoenix Paintings, without conducting detailed research on important aspects such as color settings and technological processes.

To sum up, there are currently only a few published literature studies on Anhui Phoenix Painting in China, and most of them remain at the conceptual research level. Although there are also articles that focus on analyzing the artistic characteristics of Anhui Phoenix Painting and interpreting the culture of Anhui Phoenix Painting. Connotation, but there is no document that forms a complete research system on Anhui Phoenix Painting, and there is no content on its protection and development at all. Therefore, the research on the protection and development of Anhui Phoenix paintings, especially the digital protection and development, is still blank in China.



CHAPTER III

Research Methods

This chapter uses qualitative research methods, and the researcher chooses Anhui Province as the research area. Since this area is an intangible cultural heritage with the representative Phoenix Painting, the researchers selected key informants in the area as research clues. Therefore, this study was conducted as follows.

3.1 Research Scope

3.1.1 Research Content

3.1.2 Research Framework

3.1.3 Research Method

3.1.4 Research Area

3.1.5 Research Cycle

3.1.6 Population and Sample

3.2 Research Administration

3.2.1 Research Tools

3.2.2 Data Collection

3.2.3 Data Process and analysis

3.2.4 Research Result and Presentation

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3.1 Research scope

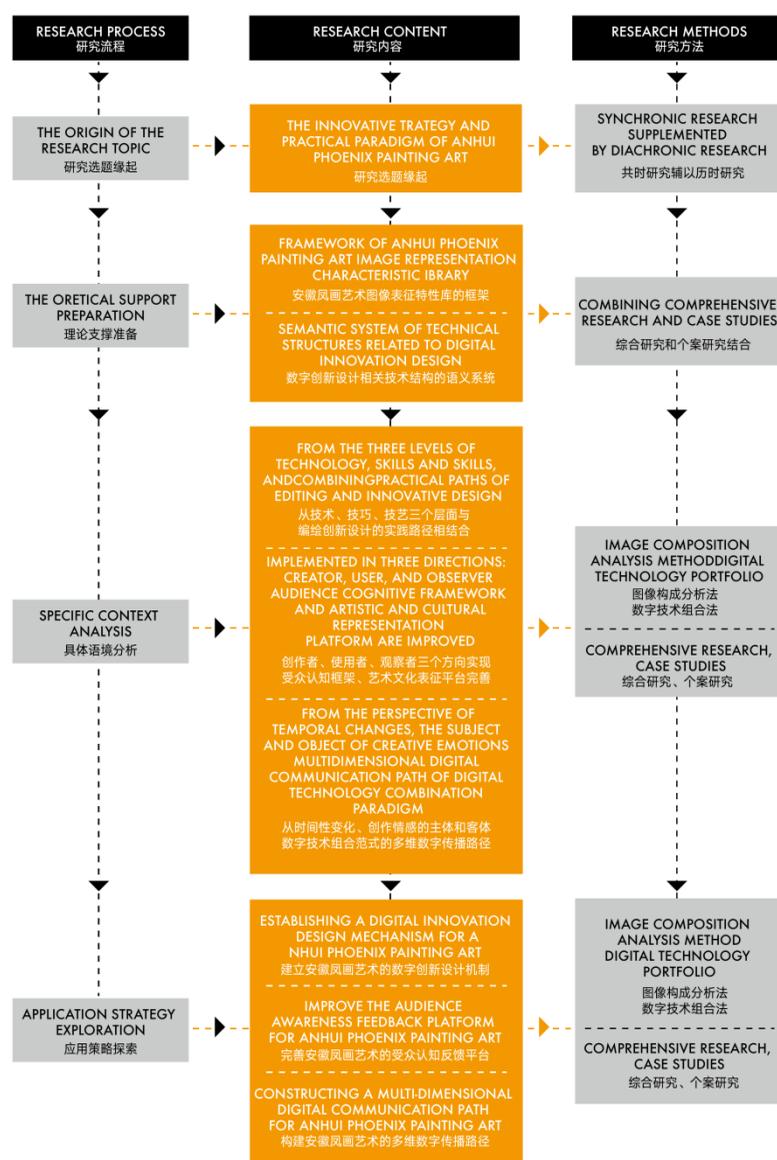
3.1.1 Research content

Anhui phoenix painting art is not only an important cultural heritage in the thousands of years of Chinese civilization, containing rich historical information and cultural value, but also an important carrier of cultural construction and dissemination in today's rural construction and development. It has significant research, protection and and heritage value. As an important fulcrum of Anhui culture, Anhui phoenix painting art is typical and representative in traditional Chinese art, and has extremely high artistic, cultural and historical value. Under the requirements and guidance of the "Opinions on Promoting the Implementation of the National Cultural Digitalization Strategy" issued by the General Office of the CPC Central Committee and the General Office of the State Council, this article takes Anhui phoenix painting art as the research content and digital innovation design as the research approach and method, focusing on the structure of Anhui The essence of the "mutual integration strategy" between the practice mechanism of phoenix painting art and digital innovative design technology is to rely on digital technology to integrate the "related parties" of Anhui phoenix painting art (technology holders, skill creators and skill inheritors) The subjective construction, spatial meaning, transformation narrative and other elements are effectively integrated through innovative design and practical mechanisms, and the inheritance and development of Wandong's traditional art and its shared value in the Chinese cultural panorama are realized when the technical conditions are met. .

In the innovative development of Anhui phoenix painting art, the practical paradigm of digital technology determines the innovative design strategy to a large extent, and is a key link in the effective development of traditional art. The purpose of the research on the practical mechanism is to correctly and objectively determine the historical value, current situation and development potential of traditional art based on measurable standards, and to provide scientific basis for the effective development of

Anhui Phoenix art. At present, there is still a lack of an overall and systematic comprehensive practice mechanism system in the innovative development process of Anhui Phoenix art. The previous practice paradigms are mostly based on the objective depiction system of traditional art. The content focuses on the reproduction of historical and cultural values and lacks the starting point from comprehensive value innovation. A practical paradigm that closely integrates traditional art with the sustainable development of digital China.

Table 4. Thesis research process table



3.1.2 Research framework

3.1.3 Research methods

At present, the existing research on phoenix painting art in Anhui Province mainly focuses on the sorting and analysis of a specific painting, creator or creative technique. The overall performance research status is scattered and individual considerations; this topic will be combined with case studies and based on digital innovative design commonality, explore the innovative development paradigm of the overall design art of Anhui Phoenix art images and the digital transformation of art culture. In the specific process, through exhaustive field investigations, we combine theoretical research and practical paths to realize traditional culture and digital culture. A comprehensive discussion of effective integration, theoretical system and practical creation.

3.1.3.1 Image composition and digital technology combination analysis method

The image composition analysis method in this article is mainly used to construct the artistic representation characteristics of phoenix painting art in Anhui Province, sort out and analyze the inherent creative rules of the image ontology, and explain relevant rationales; the digital technology combination method is used to achieve the combination of image elements to match digital innovation Design technology, realize experiments in the combination of different image characteristics and different technologies, multiple technical expressions of the same image characteristics, and the fusion of multiple images with the same technology, and explore the combination of Anhui Phoenix art images and digital innovative design and the creative practice path .

As shown below () In order to fully develop the relationship between the image extraction of phoenix painting art in Anhui Province and users, this article went to many kindergartens in Chuzhou to allow children to participate in extracting

phoenix painting elements; as shown below (10) teenagers extracted phoenix painting elements and reported and analyzed this article to select different Users of all ages participate in drawing elements of phoenix paintings, and study the image composition of phoenix paintings based on users in a more diversified manner.



Figure 10. Children extract elements from phoenix paintings



Figure 11. Teenagers extract elements of phoenix paintings and report and analyze them

3.1.3.2 Literature research method

Through literature survey and combing, this article focuses on traditional cultural and artistic images taking the phoenix painting art images of Anhui Province as an example. How to effectively establish digital development requires the integration of multi-disciplinary resources. Therefore, this article uses the phoenix painting art of Anhui Province as a test site. Establish a database of phoenix painting images, use digital images as the starting point to analyze the path and paradigm of its innovative design, and provide theoretical and practical support for the digital expression of intangible cultural heritage projects.

3.1.3.3 Field research method

Through field investigation and research, this article understands the origin, development, inheritance and current situation of phoenix painting art, collects and records relevant information, and deeply explores its artistic characteristics, expression forms, techniques and other characteristics, thereby promoting the protection and dissemination of phoenix painting art. and innovation. The field survey method can help understand the creative background, thoughts and creative methods of artists, discover and summarize the excellent traditions of phoenix painting art, and promote the inheritance and innovative development of traditional skills of phoenix painting art. At the same time, field surveys can also explore the status and influence of phoenix painting art in the local area and society, and provide basis and suggestions for relevant policy formulation.

As shown below () This article relies on the Anhui Phoenix Art Research Center and Chuzhou University's 2022 summer "Three Going to the Countryside" social practice organization to go to Anhui, Anhui to carry out "investigative research on the digital innovative design of Phoenix art images in Anhui Province" Field research, and finally won the honor of "Excellent Team" in the event.



Figure 12. Field research on digital innovative design research on phoenix painting art images in Anhui Province

3.1.3.4 Multidisciplinary research method

This article deeply explores and analyzes the multi-dimensional characteristics and connotations of phoenix painting art by combining theories, methods and research tools from different disciplines. This research method can

transcend traditional subject boundaries and comprehensively analyze and interpret painting art from the perspectives of art history, anthropology, sociology, psychology, cultural studies and other disciplines. Through multi-disciplinary interdisciplinary research, we can deeply analyze the relationship between painting art and historical, social, cultural and other factors, and reveal its connection with the local human environment, social changes and the creativity of artists. At the same time, multidisciplinary interdisciplinary research can also help discover the innovation points and potential development directions of phoenix painting art, and provide theoretical and practical support for its protection, inheritance and promotion. In addition, the multidisciplinary interdisciplinary research method can also promote academic exchanges and cooperation, involve researchers and experts from different fields in the study of phoenix painting art, bring together the wisdom and resources of all parties, and promote the in-depth development of phoenix painting art research. To achieve a more comprehensive and diverse understanding at the academic and practical levels.

3.1.3.5 Classification and comparative research method

This article classifies, compares and analyzes the art of phoenix painting to explore the differences and commonalities between different schools, styles, techniques and other aspects. This research method can help understand the differences between phoenix painting art in different regions, periods or individuals, and reveal the influence of factors such as regional culture, historical evolution and the artist's own style on the development of phoenix painting art. Through the method of classification and comparison, painting art can be comprehensively organized and sorted out, divided into different types, and each type can be studied in detail to understand the differences in characteristics, subject matter, content, techniques, etc. At the same time, comparative research can also deeply explore the connection and interaction between phoenix painting art and other related art forms (such as

traditional painting, folk crafts, etc.), and broaden the knowledge and understanding of phoenix painting art. In addition, the classification and comparative research method can also provide reference and guidance for the protection, inheritance and development of phoenix painting art. Through the comparative study of different schools and styles, excellent traditions can be excavated and summarized, and the inheritance and innovative development of traditional skills of phoenix painting art can be promoted. At the same time, comparative research can also help the art of painting diversify, expand its expression methods and connotations, and enhance its attractiveness and competitiveness.

3.1.4 Research area

The research area of phoenix painting art in Anhui Province takes Anhui County, Anhui Province as the core area. From the areas, schools, creation locations or time periods involved in phoenix painting art, it is determined based on the research purpose and questions. Specifically, the phoenix painting art in Anhui Province is determined. The research area of painting art can be set from the following aspects:

3.1.4.1 Art creation area

The research area is limited to the main creation areas of phoenix painting art, such as Suxian, Huoshan, Taihu and other places. These areas have relatively famous painting artists or schools with specific artistic traditions and styles, and their artistic characteristics and development evolution can be explored in depth.

3.1.4.2 Art creation time period

The research area can be set to a specific time period, such as the Ming Dynasty, Qing Dynasty, modern times, etc. There may be differences in the expression forms, techniques and subject matter content of phoenix painting art in different time periods. These differences and changes can be studied in depth by setting the research area.

3.1.4.3 Art schools

You can choose a specific phoenix painting art school, such as Suxian School, Huoshan School, Wannan School, etc., and set the research area on the artists, works and creative background of the school to gain an in-depth understanding of the characteristics, techniques and creative background of the school. influencing factors.

3.1.4.4 Regional culture and social background

The research area can be set in a specific regional culture or social context, such as rural communities, mountainous areas, etc., to study the inheritance, innovation and significance of phoenix painting art in these specific contexts.

3.1.5 Research cycle

The research cycle of painting art in Anhui Province fully conducts theoretical and practical research based on factors such as research purpose, complexity of the problem, and resource investment. This article investigates and analyzes the main objects of the phoenix painting art in Anhui Province from the following stages.

3.1.5.1 Research planning and preparation phase

Determine the research purpose, questions and scope, formulate a research plan, collect relevant materials and literature, and understand the cutting-edge and existing research results in the research field.

3.1.5.2 Survey and field research phase

Conduct field surveys, on-site inspections and data collection on phoenix painting art, including interviews and exchanges with artists, experts, relevant organizations and places, and observe and record the actual performance of phoenix painting art.

3.1.5.3 Data analysis and comparative research stage

Organize and analyze the collected data and information, compare the differences and commonalities between different artists, genres or regions, and deeply explore the characteristics, development trends and influencing factors of painting art.

3.1.5.4 Results presentation and paper writing stage

Based on the research results, write a research report or academic paper, and conduct relevant charts and case analyses. This stage requires organizing, summarizing and summarizing the research results, and clearly presenting the research findings and conclusions.

3.1.6 Population and sample

This article can involve multiple levels of population and samples when conducting research on phoenix painting art in Anhui Province. First of all, artists are very key participants. They include traditional masters of phoenix painting art, well-known contemporary artists and young and emerging creators. Through communication and observation with these artists, we can gain an in-depth understanding of their creative background, ideas and artistic styles.

3.1.6.1 Artist

This article talks with traditional masters of phoenix painting art, well-known contemporary artists, young and emerging creators, etc. They are the actual creators and inheritors of phoenix painting art. Through communication and observation with them, we can gain an in-depth understanding of their creative background, thoughts and Art style.

As shown in the picture (13) Tang Qinzhi, a native of Anhui County, Anhui Province, began to engage in the creation and research of Anhui Phoenix Painting in 2006. He is a member of the Chinese Folk Artists Association, the president of Anhui County Anhui Painting Research Association, and the representative inheritor of Anhui Phoenix Painting. Through in-depth exchanges with him, he said that art and culture not only need inheritance, but also innovation. Only by keeping close to the pulse of the times and integrating creation into the current of the times can such works have the eternal value of recording the times. Good art is bold and pioneering without deviating from historical blood. The inheritors

represented by Tang Qinzhi continue to explore and innovate the expression forms of phoenix paintings, so that this folk art with unique local characteristics and artistic style can be better inherited. and development, develop in inheritance, and innovate in development.



Figure 13. Exchange scene with Tang Qinzhi

3.1.6.2 Arts institutions and groups

As shown below (14) This article cooperates with organizations such as the Phoenix Painting Art Association, painting academies, and colleges. Professional researchers, educators, exhibition planners and other related personnel can be found within these institutions or groups to jointly organize the "Anhui Phoenix Painting Art Exhibition". Exhibition to realize the development and promotion of Anhui phoenix painting art.



Figure 14. "Anhui Phoenix Painting Art Exhibition" scene

3.1.6.3 Cultural scholars and researchers

Including experts and scholars engaged in art research and cultural research, through interviews or in-depth exchanges with them, you can gain theoretical and academic perspectives on the art of painting, and enrich the depth and breadth of research topics.

3.1.6.4 Community and public representatives

Local communities, non-governmental organizations and promotion activities involving the art of phoenix painting can randomly select a certain number of samples from the public to conduct communication in the form of surveys, questionnaires or symposiums to understand the public's awareness, preferences and needs for the art of phoenix painting, reflecting the influence and acceptance of phoenix painting art by the grassroots society.

3.2 Research management

This article conducts research on the phoenix painting art of Anhui, Anhui Province through four levels: research tools, data collection, data processing and analysis, and research results and publication. In this process, a series of scientific research tools are used, including but not limited to literature. Materials, field surveys, expert interviews, questionnaires, image analysis, etc. By comprehensively using these research tools, we can obtain comprehensive and multi-angle data and information, and further understand the history, techniques, themes, artists, etc. of Anhui Phoenix Painting art.

In terms of data collection, we use a systematic and scientific method to obtain necessary data, which includes field research, observing phoenix painting art works in Anhui area, visiting art academies, and understanding the artist's creative process. At the same time, expert interviews and questionnaires can also be conducted to collect

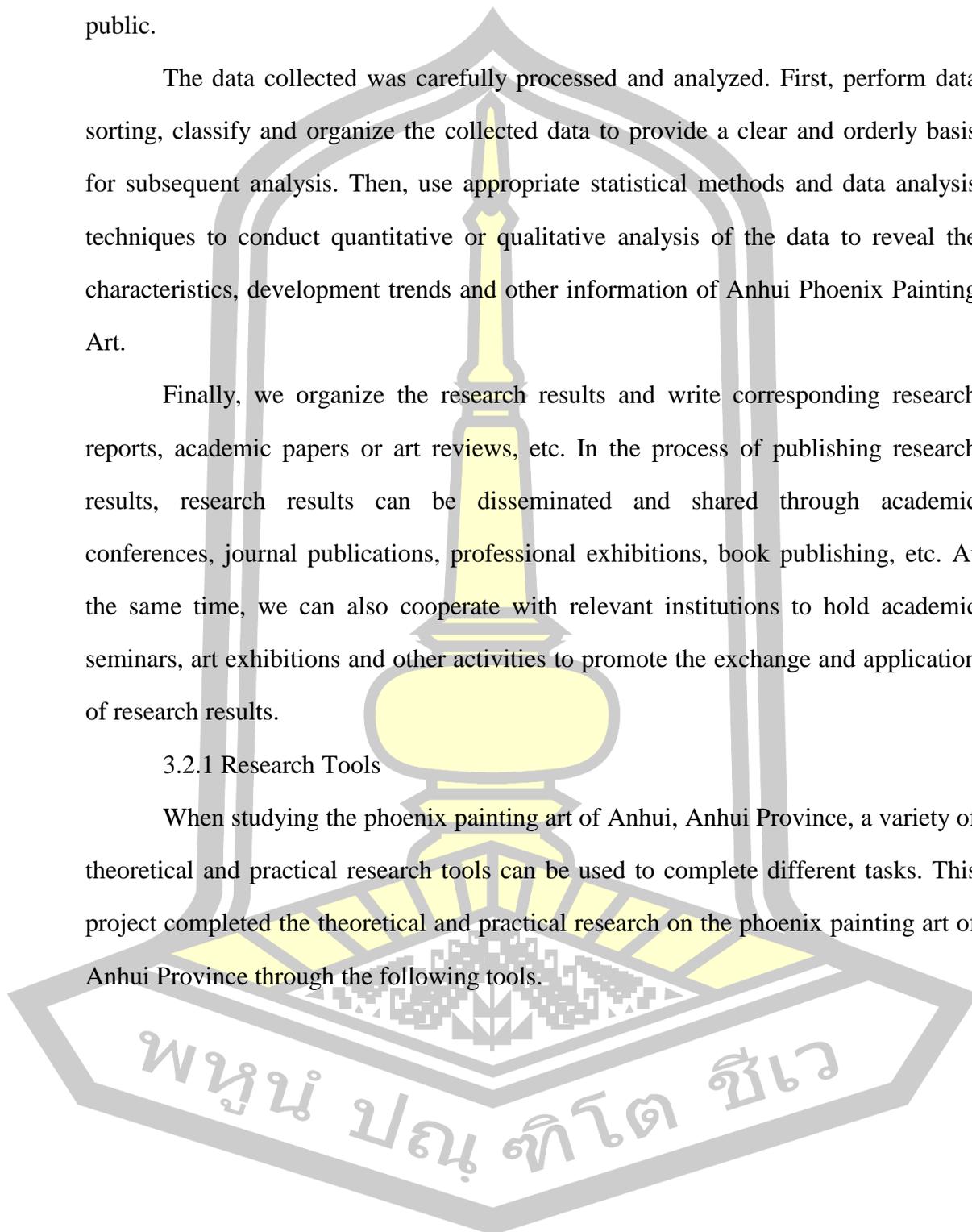
different views and opinions from the perspectives of artists, experts, scholars, and the public.

The data collected was carefully processed and analyzed. First, perform data sorting, classify and organize the collected data to provide a clear and orderly basis for subsequent analysis. Then, use appropriate statistical methods and data analysis techniques to conduct quantitative or qualitative analysis of the data to reveal the characteristics, development trends and other information of Anhui Phoenix Painting Art.

Finally, we organize the research results and write corresponding research reports, academic papers or art reviews, etc. In the process of publishing research results, research results can be disseminated and shared through academic conferences, journal publications, professional exhibitions, book publishing, etc. At the same time, we can also cooperate with relevant institutions to hold academic seminars, art exhibitions and other activities to promote the exchange and application of research results.

3.2.1 Research Tools

When studying the phoenix painting art of Anhui, Anhui Province, a variety of theoretical and practical research tools can be used to complete different tasks. This project completed the theoretical and practical research on the phoenix painting art of Anhui Province through the following tools.



3.2.1.1 Theoretical research tools

Table 5. heoretical research tools table

Serial number	name	tool	method
1	Library	Library or public library, check the collection of books, journals and academic papers.	Offline inquiry
2	Academic journals and database systems	CNKI, WanFang Data, ScienceDirect	online
3	Online academic search engines	Google Scholar, Academic Search Complete, Scopus	online
4	Academic Institution Websites	Visit official websites of universities, research institutions or academic associations, etc.	online
5	Academic conferences and seminars Attend academic conferences,	seminars or academic lectures to learn about the latest research trends and obtain information on relevant literature and contact information of authors.	Online and offline
6	Social academic platform	Share and communicate with other researchers on academic social platforms, such as ResearchGate, Academia.edu, etc., and obtain literature resources such as papers, books, and reports.	Online and offline
7	Academic mentors and experts Consult your own academic mentors	They may be able to provide recommendations or guidance on relevant literature and introduce	Online and offline

	or experts	important literature resources in related fields.	
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3.2.1.2 Practical research tools

Table 6. research tools table

Serial number	Category	Tool name	Purpose
1	design software	Adobe series software (such as Photoshop, Illustrator, InDesign), Sketch, Figma, etc.	For interface design, graphic design and interaction prototyping
2	3D modeling and rendering tools	Blender, Autodesk Maya, Cinema 4D, etc.	For creating virtual 3D scenes, objects and animations
3	creative tools	MindMeister, XMind, Balsamiq, Axure	Used to organize and present creative ideas, create interactive prototypes and user experience testing
4	Data visualization tools	Tableau, Power BI	Used to transform data into visual charts and dashboards to help understand and communicate data information
5	Front-end development tools	HTML, CSS, JavaScript, React, Angular, Vue	Used for front-end development languages, as well as development frameworks and libraries, to achieve interactive and dynamic effects of user

			interfaces
6	Virtual reality and augmented reality tools	Unity, Unreal Engine	For creating virtual reality and augmented reality applications
7	Collaboration and project management tools	Trello, Asana, Jira	Used for project progress management, task allocation and team communication
8	User research and testing tools	Optimal Workshop, UserZoom, InVision, UsabilityHub	Used to obtain user feedback and evaluate design usability

3.2.2 Data collection

3.2.2.1 Data collection tools

Table 7. Data collection tools table

Serial number	Data category	use tools	Collection purpose
1	Image text collection	Video recorders, cameras, scanners, printers, Gopro, Foxit REC, etc.	Record the creative process, lectures, exhibitions and other activities of illustration artists for subsequent analysis and observation.
2	Questionnaire design	Google Forms, SurveyMonkey	Design an online or paper questionnaire to understand the public's awareness, attitude and demand for the art of Anhui Phoenix Painting
3	Data sorting	Microsoft Excel,	Classify, organize and statistically

	and analysis	SPSS、NVivo	analyze the collected data
4	File storage and management	Google Drive、OneDrive、EndNote、Zotero	Manage and store collected documents, pictures and other relevant materials

3.2.2.2 Purpose of data collection

3.2.2.2.1 Understand the historical development, school characteristics and regional characteristics of Anhui phoenix painting art

By collecting documents, artworks, folklore, etc. about the art of Anhui Phoenix Painting, we can comprehensively understand its origin, development process, main schools, technical characteristics, and regional cultural characteristics.

3.2.2.2.2 Analysis of the market value and influence of Anhui phoenix painting art

By collecting data on the market demand, collection value, exhibition activities, etc. of Anhui Phoenix painting art, we can evaluate its status and influence in the art market.

3.2.2.2.3 Investigate the current creative situation and development needs of Anhui Phoenix artists

By collecting data on the creative environment, creative conditions, and creative achievements of Anhui Phoenix painting artists, we can understand their current creative status and development needs, and provide a basis for policy formulation and support measures.

3.2.2.2.4 Explore ways to inherit and innovate the art of Anhui phoenix painting

By collecting data on the traditional skills, modern innovation, and educational inheritance of Anhui Phoenix Painting Art, we explore how to carry out innovative development while maintaining traditional characteristics and improve its artistic value and social influence.

3.2.2.2.5 Promote international exchanges and cooperation in Anhui phoenix painting art

By collecting data on the performance of Anhui phoenix painting art in the international market and the degree of attention of international art institutions to it, we will promote Anhui phoenix painting art to the world and strengthen international exchanges and cooperation.

3.2.3 Data processing and analysis

This article collects phoenix painting art works from various regions in Anhui Province, including ancient, modern and contemporary works, covering various themes, styles and techniques, and classifies and organizes the collected phoenix painting art works. and numbering, an art database of phoenix paintings in Anhui Province was established. At the same time, the creation year, author, subject matter, style, technique, etc. of the work are recorded and marked in detail.

By analyzing the data of phoenix painting art works using the above analysis tools, we found that phoenix painting art in Anhui Province has the following characteristics:

3.2.3.1 Long history

The phoenix painting art of Anhui Province originated in the Ming Dynasty and has a history of more than 600 years. As time goes by, the art of phoenix painting continues to develop and grow in Anhui, forming unique regional characteristics.

3.2.3.2 Rich themes

The paintings and art works in Anhui Province have rich and diverse themes, including myths and legends, historical stories, folk customs, etc., reflecting the history, culture and folk customs of the Anhui region.

3.2.3.3 Unique style

On the basis of inheriting the tradition, the phoenix painting art of Anhui Province has formed its own unique style, such as smooth lines, bright colors, dense and dense composition, etc., which shows the unique charm of Anhui phoenix painting art.

3.2.3.4 Diverse techniques

On the basis of inheriting traditional techniques, phoenix painting artists in Anhui Province continue to innovate and develop, forming a variety of techniques. Such as meticulous brushwork, freehand ink painting, paper-cut collage, etc., which enrich the expression techniques of painting art.

3.2.3.5 Market environment

At present, phoenix painting has gained certain recognition in the art field, but since the reform and opening up, this traditional art still faces some problems. First of all, due to the lack of support from industry standards and relevant policies, the development of phoenix paintings has been subject to certain restrictions. Secondly, the lack of talents is also a problem that cannot be ignored, which directly affects the innovation and development of Feng Hua. In order to protect and inherit this precious cultural heritage, the government and people in the cultural and art circles should take measures to strengthen the protection and promotion of phoenix paintings, and at the same time pay attention to cultivating a new generation of phoenix painting artists.

3.2.4 Research results and publication

3.2.4.1 Research results on Anhui phoenix painting art

The research results of Anhui phoenix painting art have conducted in-depth research on the history, artistic characteristics, cultural connotation, protection and inheritance, and innovative development of phoenix paintings from multiple perspectives, providing rich theoretical resources and practical guidance for the inheritance and development of phoenix paintings.

By analyzing the origin, development process and representative works of Anhui phoenix paintings in each period, the historical status and cultural value of phoenix paintings in Anhui are revealed. At the same time, the exchange and integration of phoenix painting and other regional painting styles were discussed, demonstrating the unique charm of phoenix painting in traditional Chinese painting. This paper conducts an in-depth analysis of the artistic characteristics of Anhui phoenix paintings from aspects such as composition, lines, colors, and images, and summarizes the techniques and expression techniques used in the creation process of phoenix paintings. In addition, a comparative study was conducted on the techniques of phoenix painting and other painting schools, providing theoretical support for the inheritance and development of phoenix painting. Through the analysis of the cultural elements, symbolic meanings and social background contained in Anhui phoenix paintings, the important position of phoenix paintings in Chinese traditional culture is revealed. At the same time, the spread and application of phoenix paintings in modern society are discussed, providing ideas for the innovative development of phoenix paintings.

In view of the protection and inheritance issues faced by Anhui phoenix paintings in modern society, a series of specific protection measures and inheritance strategies were proposed. Including strengthening the research and education of phoenix painting art and cultivating more phoenix painting talents; increasing the publicity of phoenix painting to improve the public's understanding and appreciation of phoenix painting; promoting the combination of phoenix painting and modern

technology and expanding the scope of phoenix painting. application fields, etc. Combining modern aesthetic concepts and market demand, the innovative development of Anhui Phoenix was explored. Including innovation and improvement of traditional phoenix painting techniques, as well as expansion and enrichment of phoenix painting themes and forms. Through these innovative practices, new impetus has been provided for the future development of Anhui Phoenix .

3.2.4.1.1 The origin and development of phoenix paintings

Study the origin of phoenix painting, explore its development and changes in different historical periods, and its interaction with other art forms.

3.2.4.1.2 Painting techniques and styles

Analyze the painting techniques of phoenix painting, such as lines, colors, composition, etc., as well as its unique artistic style and aesthetic characteristics.

3.2.4.1.3 The symbolic meaning of phoenix paintings

Discuss the symbolic meaning of phoenix paintings in traditional Chinese culture, such as auspiciousness, beauty, harmony, etc., as well as its value and significance in modern society.

3.2.4.1.4 Protection and inheritance of phoenix paintings

Study the current status of protection of phoenix paintings and propose strategies and methods for protecting and inheriting phoenix paintings, such as strengthening policy support, carrying out education and training, holding exhibitions and exchange activities, etc.

3.2.4.1.5 Integration of painting and other art forms

Discuss the integration and innovation of phoenix painting with modern art, design, architecture and other fields to provide new ideas and directions for the innovative development of phoenix painting. This direction is the key practice direction of this article.

3.2.4.2 Anhui Phoenix Painting Art Publishing Method

3.2.4.2.1 Academic papers

Write research results into academic papers and submit them to academic journals in related fields, such as art, art history, cultural studies, etc..

3.2.4.2.2 Academic conference

Participate in academic conferences in related fields at home and abroad to display and exchange results to increase the influence and visibility of research.



Figure 15. Academic Lecture on Phoenix Painting

3.2.4.2.3 Special reports

By holding "Anhui Summer Camp", experts are invited to submit special reports to the government, enterprises, institutions, universities and other institutions to provide decision-making reference for the protection and inheritance of phoenix paintings.



Figure 16. Phoenix painting special summer camp activities

CHAPTER IV

Research results

The research results of this chapter are based on the image and text collection architecture of Anhui phoenix Art in digital innovation design, the innovative design practice application of Anhui phoenix Art based on digital graphic language, and the cultural value composition mimicry of Anhui Feng Hua Art based on digital culture construction. The three parts jointly complete the verification and in-depth research of the research results, demonstrating the digital innovation design application paradigm of Anhui phoenix Art.

4.1 Image and text collection architecture of Anhui Province's phoenix painting art based on digital innovative design

4.1.1 To study the historical origins, artistic value and cultural identity of Anhui phoenix painting art.

4.1.2 Integrate image information and establish a digital image library

4.1.3 Summary

4.2 Practical application of innovative design of phoenix painting art in Anhui Province based on digital graphic language

4.2.1 To study the image composition, aesthetic characteristics and innovative applications of Anhui phoenix painting art.

4.2.2 Innovative application and practical achievements of Anhui Phoenix painting art.

4.2.3 Summary

4.3 The cultural value of phoenix painting art in Anhui Province based on digital cultural construction constitutes mimicry

4.3.1 To study the application paradigm of Anhui phoenix painting art in digital innovation design in the new era.

4.3.2 Multidimensionality: "Tradition" is a dynamic category that is sustainable and stable

4.3.3 Dynamicity: the possibility and necessity of modern transformation of traditional systems

4.3.4 Universality: understanding and constructing traditional systems in the world cultural pattern

4.3.5 Summary

4.1 Image and text collection architecture of Anhui Province's phoenix painting art based on digital innovative design

4.1.1 To study the historical origins, artistic value and cultural identity of Anhui phoenix painting art.

4.1.1.1 Improve image steering and mimicry digital information sources

Image-to-Image Translation is a technology that converts input images into image output with specific media attributes or media styles. In this era, the media transmission method has changed from mass media playback to digital new media interaction. Media information is no longer a one-way, point-to-surface, high-to-low power model of the first media era, but has transformed into a two-way, decentralized media. The subjective construction and integration of digital images and technology holders of Phoenix Art in Anhui Province firstly completes the determination of image steering technology, fully considers improving the image steering algorithm, improving the accuracy and fidelity of ontology image conversion, and exploring more advanced Deep learning models, generative adversarial networks (GAN) and other technologies are used to achieve better image steering effects; secondly, the data set is expanded to establish a richer and more diverse ontology image information

source, including images with various attributes and styles, to help Improve the generalization ability and steering effect of the image steering algorithm; finally establish close cooperation with users, understand user needs and feedback, and collect user suggestions through interactive interfaces and other methods, so as to achieve image steering that is more in line with user expectations, emphasizing the use of real-life The two-way mapping, real-time interaction and dynamic feedback between the data model and the image system enable the ontology of image steering to evolve while achieving situation prediction of accurate information sources.

The famous French philosopher Paul Virilio pointed out: "After synthetic images, that is, images produced by computer graphics software, and after digital image processing in computer-aided design, then comes the era of synthetic vision, the era of perceptual automation. "Based on the ontology image shift, mimetic digital information sources should fully consider their accuracy and authority. In mimetic digital information sources, the source and collection method of the information should be clearly marked so that participating users can understand the reliability of the ontology image information. and integrity; the cross-media nature of digital images not only reflects the shift in media images, but also penetrates and affects its own image changes. Through a variety of verification methods, such as cross-confirmation, expert review, etc., the credibility of the digital information released is ensured. Credibility, enabling information verification and adoption of digital information sources.

As a visual text, digital images not only present the extended cognition and expression of ontological events through visual word order, but also record the development trajectory of time ontology in real time. Therefore, digital images are both a medium for innovative design and a form of event text expression. Michel points out: "In our time, the life of the image has undergone a decisive transformation: due to the emergence of new media constellations on all levels. The ancient legend of

using artificial technology to create living images, intelligent beings has both theoretical and operational. From the perspective of iconographic genealogy, the images of phoenix painting art in Anhui Province can be divided into two categories: one is the folk art images created by humans in history and passed down to this day in living form; the other is For subjective art images created on the basis of folk art, the former can be called "primary images" and the latter "secondary images". 4.1.1 the historical origins, artistic value and cultural identity of Anhui phoenix painting art.

In the field of digital images, subjective construction and fusion usually refers to creating new images or visual effects by selecting, editing, and combining images or image elements from different sources. Through the behavioral relationship between the technology holder and the ontology, the complete mapping and digital image model of the ontology image events are realized, and a full cycle, all elements and all-round image system of the ontology events are constructed, integrating digitalization, virtualization and intelligence. Relevant algorithm models realize the adaptability of physical elements and spatial elements of physical space. For the phoenix painting art of Anhui Province, this process involves the construction and integration of relevant factors such as the image holder's perspective, creativity, and artistic aesthetics. Its essence is a collection of events, information, and elements that characterize the image, forming an interdisciplinary, Physical space and digital attributes, for the performance test of the ontology digital model, image mechanism and media technology, through the integration from abstraction to concreteness, establish a digital media system that is fully adapted to the artistic images in the digital space, and realize the image system from the information source. From the chart book to the image library, the whole system has sensing and collaborative working functions.

4.1.1.2 Sorting out image events and modal digital charts

Image events can record events that occur at a specific time and place in the form of images. In different fields and backgrounds, image events can include different contents and scopes, such as news events, historical events, social activities, natural disasters, scientific experiments, etc. As Fluster said: "Technical images are born out of a contradictory gesture, out of the complex confrontation and cooperation between the inventor and operator of the device, the device and the user." For the combing of the image events of Feng Hua Art in Anhui Province, image events can be captured and presented through photography, videography and other image recording technologies, and the original scenes, characters, situations and details of the reproduced events can be truly recorded and displayed so that users can observe them through And analyze these images to understand the development process and specific details of the event, and then conduct research, comment and memory on the event, triggering users' emotional resonance and conveying deep-seated information and values.

In the process of sorting out the images of phoenix painting art in Anhui Province, from collecting image data of the ontological events, filtering and sorting, analyzing and describing, sorting and organizing, to acquiring, archiving, processing and integrating the relevant image data of specific events, Use computer vision algorithms to automate the analysis of modal digital charts in a narrative or coherent manner. During the modal process, select the type of digital chart based on the ontology event information and target audience to ensure the integrity and accuracy of the ontology data. Use data visualization tools and programming languages to design and generate digital charts, making full use of interaction and dynamic performance. It can improve the expression effect in the process of user experience, realize the logic of the digital chart album, and then output it in a format adapted to the release channels of different carriers.

4.1.2 Integrate image information and establish a digital image library

Image information includes digital information sources and digital diagrams of ontology events, in which information about inherent attributes such as visual characteristics, environmental presentation, identification of objects, spatial carriers, emotional descriptions and component records are completely and truly stored in the digital image library, which can Through image processing and computer vision technology for analysis and extraction, its application value can be realized in many fields such as computer vision, image retrieval, pattern recognition, artificial intelligence, and cultural heritage protection.

Lev Manovich once said in the book "New Media Language": "Composition is explicit, while aggregation is implicit; combination is real, aggregation is imaginary." This article establishes The digital image library of phoenix painting art in Anhui Province realizes the integration of technology holders' information on the historical origin, painting techniques, expression forms, cultural value and other aspects of phoenix painting creation, and builds a platform for centralized storage and management of image resources. Users According to the simulation of usage scenarios in the digital image library, relevant information can be quickly adapted through keywords, tags or other metadata in the virtual and real space, automatically identifying the demand relationship of image information, and continuously interacting with extremely high flexibility and adaptability. Iteration and optimization are realized in the process, and the digital image library is updated in real time as emergency information evolves, achieving subjective construction and integration with technology holders.

The research results of this article focus on exploring how to integrate the phoenix painting art of Anhui Province in the digital age through the subjective construction, spatial meaning, and transformation narrative of digital images and

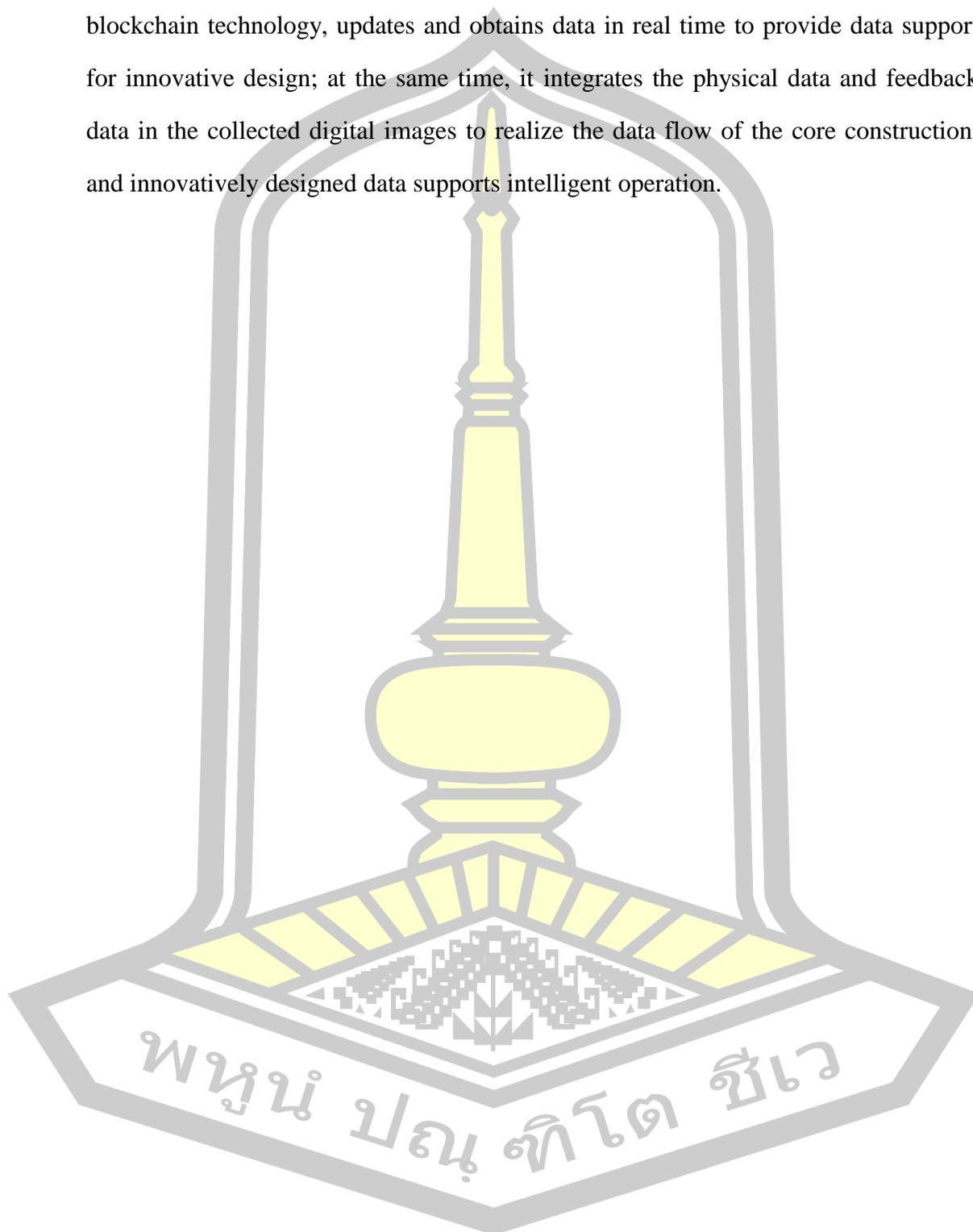
technology holders, skill creators, and skill inheritors, focusing on exploring Anhui the integration strategy of provincial phoenix painting art and digital image innovative design.

4.1.3 Summary

In the context of the image turn, digital images and media continue to undergo many transformations in representation forms. They reflect on the digital survival situation and its evolution possibilities from the perspective of phenomenology from an ontological perspective. [[[Xiong Yiran. The phenomenological dimension of the image turn—reexamination of image consciousness and media [J]. Journal of Nanjing University of the Arts (Art and Design), 2021(06):149-156.]]] As a painting category the emotional expression of intangible cultural heritage can not only allow users to achieve aesthetic immersion and experience deep virtual cultural expression through traditional techniques such as light ink and dotted lines, but also use full shapes, rich colors, and distinctive lines to attract users. Generate powerful physical emotional appeals. Emotional narrative links image reproduction and core construction in the five-dimensional model of digital space. Through interactive mapping that connects virtual and real spaces, it is supported by service models and technology platforms to provide multi-scale and precise innovative design between digital image and skill creators. Decision aid.

Driven by technology holders and skill creators, Anhui Phoenix Art Digital Image integrates digital image information sources, digital chart albums and digital image libraries in innovative design to structure the core construction, image reproduction and emotional narrative of digital space. Relevant resources, through dynamic research and judgment in digital space, can predict and analyze the morphological changes of innovative designs, so as to carry out scientific innovative design work and achieve effective innovation and precise positioning in intangible cultural heritage.

The holographic digital core model, with the support of cloud storage blockchain technology, updates and obtains data in real time to provide data support for innovative design; at the same time, it integrates the physical data and feedback data in the collected digital images to realize the data flow of the core construction, and innovatively designed data supports intelligent operation.

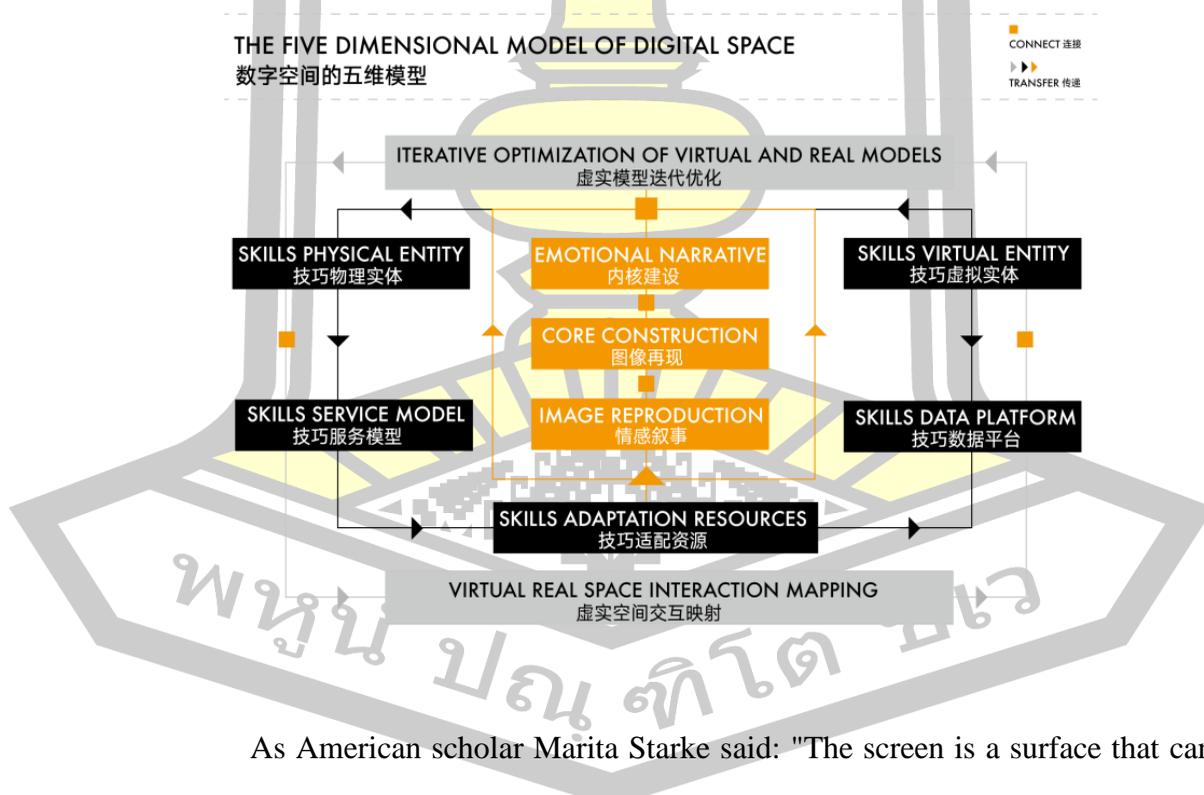


4.2 Practical application of innovative design of phoenix painting art in Anhui Province based on digital graphic language

4.2.1 To study the image composition, aesthetic characteristics and innovative applications of Anhui phoenix painting art.

On the basis of establishing a digital image library, digital images use spatial meaning to realize the combination of digital technology, digital tools and digital expression with traditional skill creation by skill creators to realize their five-dimensional model in digital space, that is, skill physics. Entity, skill virtual entity, skill service model, skill data platform, skill adaptation resources and core construction, image reproduction, and multi-dimensional connection and transmission of emotional narrative, as shown in Figure (8).

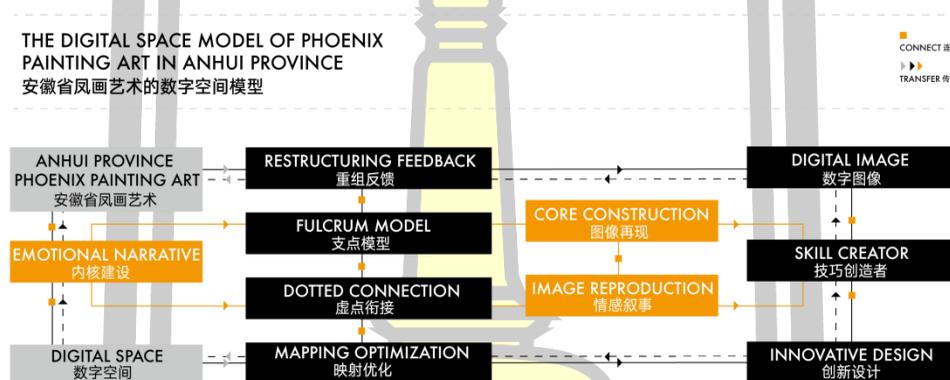
Table 8. Five-dimensional model of digital space



As American scholar Marita Starke said: "The screen is a surface that can be projected; it is also an object that allows certain things to hide from sight, and can be shielded or protected." Skill creator of Feng Hua Art in Anhui Province In the five-dimensional model of digital space, the depth of digital technology and phoenix

painting creation skills is realized in the virtual and real model and virtual and real space to achieve iterative optimization and interactive mapping, realizing the practical paradigm of physical entities and virtual entities, in core construction, image reproduction, emotion Global perception in the three dimensions of virtual and real effectively solves the slow adaptation between traditional techniques and digital technology, and the lack of coordination with the ontology of image events, as shown in Figure (9).

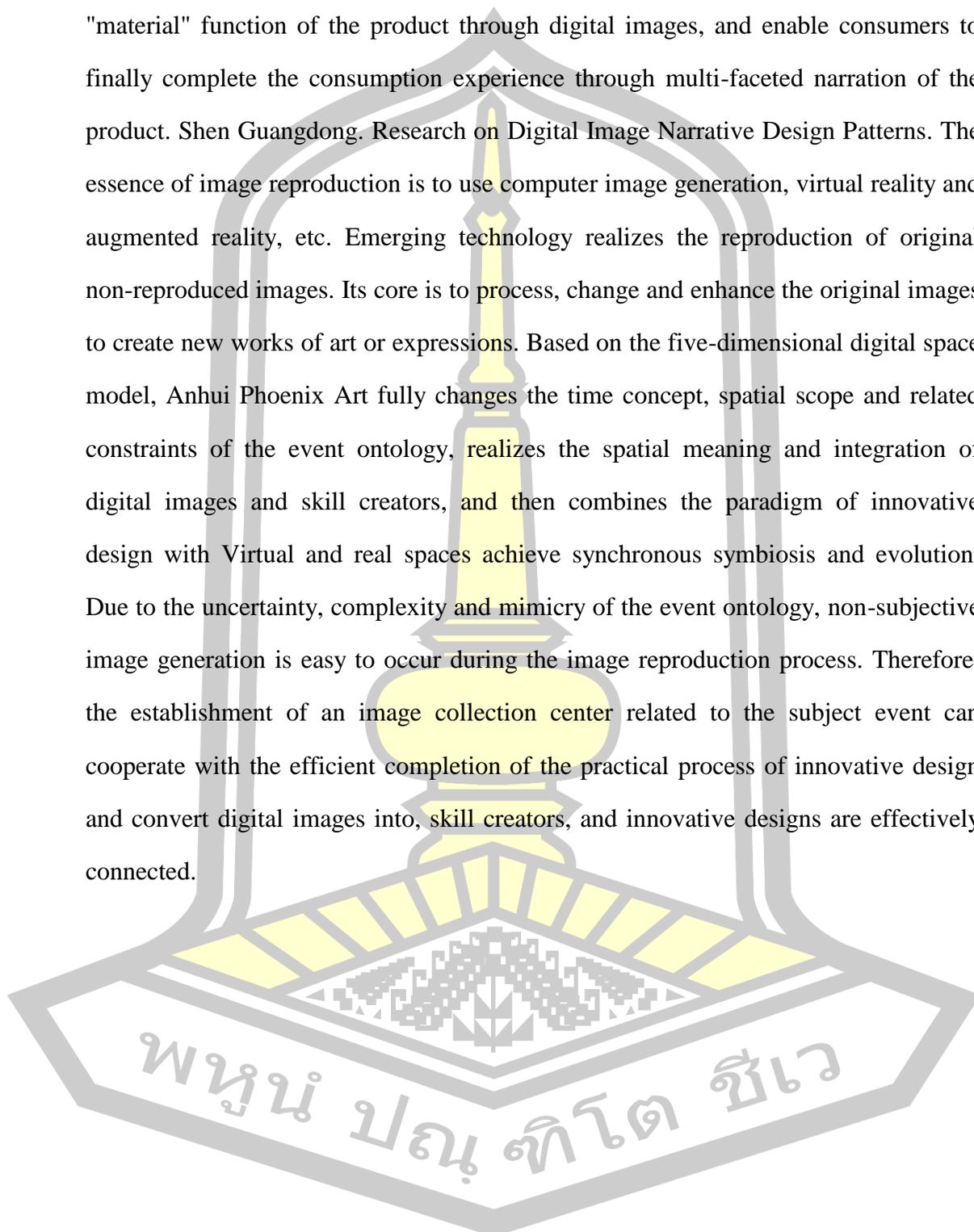
Table 9. Anhui Province Phoenix Art “Skill Creator” Digital Space Model



4.2.1.1 Cultural view of core construction

Based on the basic elements and their interactive relationships in the five-dimensional digital space model, the innovative digital image design of Phoenix Art in Anhui Province regards the core construction as the core expression of its overall operating mechanism, through "fulcrum model-virtual point connection-mapping optimization-reorganization feedback" The internal logical relationship, construct the data and service process in the digital image innovative design space model, realize the modeling, virtualization and digitization of innovative design elements, and establish the research on phoenix painting techniques, image processing tools, technology and culture platform, and streaming interactive experience. 4.1.2.2 Appeal points for image reproduction

The non-material mode of digital image narrative design is to construct the "material" function of the product through digital images, and enable consumers to finally complete the consumption experience through multi-faceted narration of the product. Shen Guangdong. Research on Digital Image Narrative Design Patterns. The essence of image reproduction is to use computer image generation, virtual reality and augmented reality, etc. Emerging technology realizes the reproduction of original non-reproduced images. Its core is to process, change and enhance the original images to create new works of art or expressions. Based on the five-dimensional digital space model, Anhui Phoenix Art fully changes the time concept, spatial scope and related constraints of the event ontology, realizes the spatial meaning and integration of digital images and skill creators, and then combines the paradigm of innovative design with Virtual and real spaces achieve synchronous symbiosis and evolution. Due to the uncertainty, complexity and mimicry of the event ontology, non-subjective image generation is easy to occur during the image reproduction process. Therefore, the establishment of an image collection center related to the subject event can cooperate with the efficient completion of the practical process of innovative design and convert digital images into, skill creators, and innovative designs are effectively connected.



Through the previous investigation and research on folk culture, this work found that folk art is an important part of fine art. Many folk art works are produced by folk activities. Because the long-term development of folk art has not attracted public attention, some folk artists' reluctance to teach folk crafts has resulted in many art forms gradually disappearing from people's sight, and folk art and culture also slowly disappearing from life. Today, with the prevalence of media, there are also various methods of communication. The development of folk art should be integrated with media throughout. Folk art should be disseminated through the combination of digital media and other media, creating a more diversified communication method for folk art and contributing to the development and inheritance of traditional folk culture. Selecting intangible cultural heritage for inheritance, we found that the painting method of phoenix paintings was too traditional, so we decided to innovate it digitally.

As a dazzling star in Chinese folk art, phoenix painting has a long history and unique style. Anhui Phoenix Painting is a folk painting art unique to Anhui area in Chuzhou City, Anhui Province, with phoenix as the painting object. Anhui phoenix paintings originated in the Ming Dynasty and were widely spread in Anhui area. It has a history of more than 600 years. Because the phoenix paintings have unique shapes, bright colors, and fine and ingenious painting techniques, they have a certain influence among the people. The general public loves phoenix paintings very much. However, with the impact of the market economy, phoenix paintings are facing survival challenges, so the phoenix paintings' inheritance and protection are urgent.

Therefore, this topic "Innovative Design and Application of Digital Images in the Folklore Context" selects Anhui Phoenix Painting Art in Anhui Province as the theme. The main research content is through the relevant elements of Anhui Phoenix Painting classic art works and the innovative design of font graphics. and application,

using the innovative design of digital images as the starting point to conduct exploration and research to help the audience better understand the art of Anhui Phoenix Painting in Anhui Province and realize the innovative inheritance and development of Anhui Phoenix Painting.

4.2. 2.2.1 Design research

With the development of the times, many excellent font illustration designs continue to emerge. The application of font design to illustrations will not only give people a sense of identity, but also allow people to enjoy the fun and meaning brought by illustrations, both consciously and unconsciously. Fusion brings unconscious innovation and integration to digital image innovation.

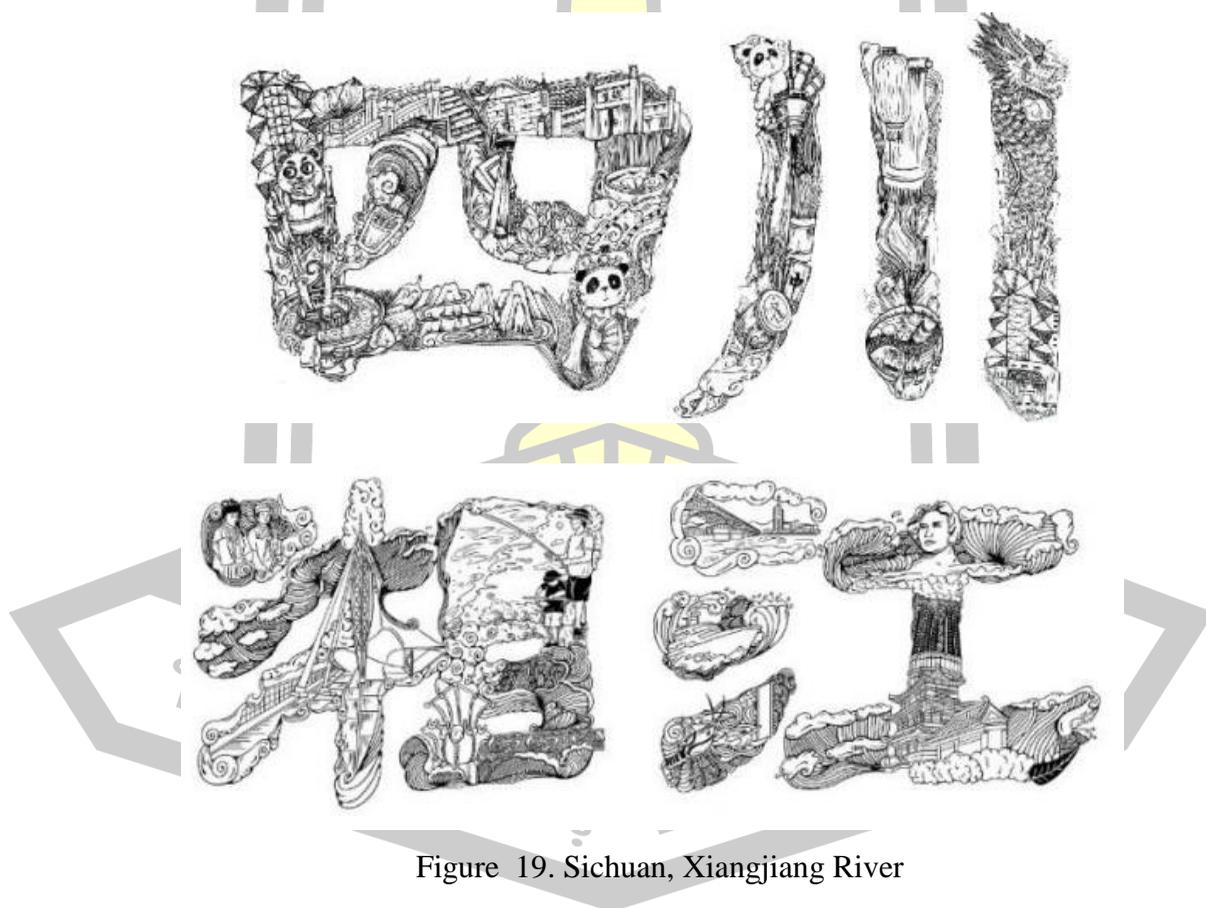


Figure 19. Sichuan, Xiangjiang River

As shown in the picture (): Sichuan, Xiangjiang, this series of works is guided by the concept of "one word, one scene, and draws the memory of the city".

Through the constituent elements of points, lines, and surfaces, Chinese characters are regarded as a medium to express the beauty of the city. . It emphasizes the importance of people paying attention to their cities and traveling within them. Through the deconstruction of Chinese characters, we can find clues that contain various urban elements. For example, a horizontal line can be a gray wall, and a crossbar can be a river. By recombining the constituent elements of Chinese characters, different patterns and visual effects can be created, creating a unique urban atmosphere. This creative method not only makes Chinese characters more visually beautiful, but also contributes to the cultural inheritance of the city and the promotion of the city's image.



Figure 20. Letter graphic design

As shown in the picture (20): Letter graphic design is a promotional poster for a tourism brand, using letters as a cultural carrier. Behind the letters are famous buildings and elements of the chosen city combined to create a colorful font that invites people to explore the graphic elements of the city in which it is located.

4.2.2.2.2. Digital collection

This project selects representative themes in Anhui phoenix painting art for digital image innovation design, integrates the names of phoenix painting art works, combines traditional phoenix painting art and modern digital technology, sorts out, lists and constructs them, and graphically shapes the fonts creative design. By constructing a design framework through the names of phoenix paintings, the works

such as "Dan Feng Chaoyang", "Hundred Birds Facing the Phoenix", "Hundred Birds Offering Longevity", "Belt to the Court", "Five Phoenixes", "Dragon and Phoenix Presenting Xiang" etc. Establish design data and conduct graphic design and creative integration of different work elements. In the visual design of this project, text is used as an important element of visual expression, so that text is not only a simple tool to transmit information, but also has the function of emotional transmission. Therefore, this project not only achieves clear and easy-to-understand visual effects by digitally collecting the names of phoenix paintings and combining them with text design, but also creates works with aesthetic, artistic and emotional resonance. The specific collection process is as follows.

4.2.2.2.2.1 Use Adobe Illustrator CC to extract the names of phoenix painting works, sort them out, list them and construct them.



Figure 21. First draft of text design for the work

4.2.2.2.2 Use Procreate to graphically combine the names of the phoenix paintings to create creative combinations.

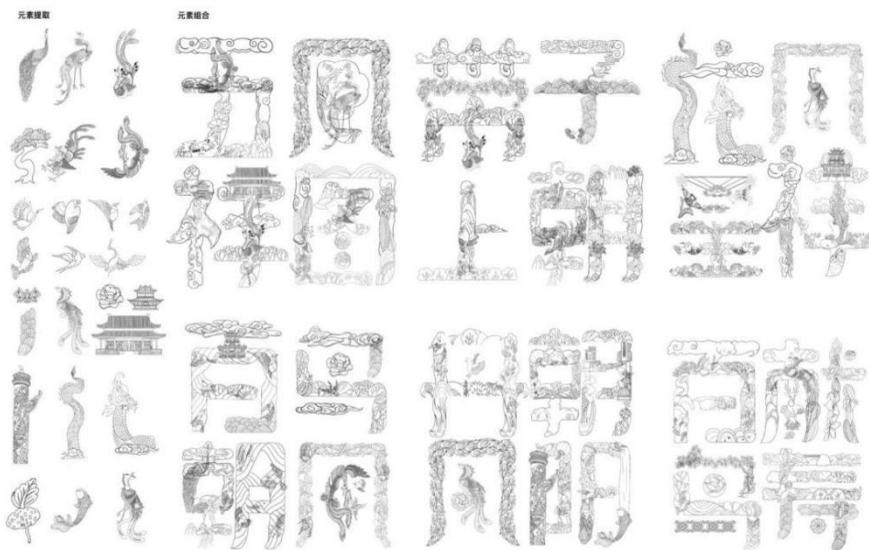


Figure 22. Work text design illustration line draft

4.2.2.2.3 Use PS to extract the color of the phoenix painting, carry out innovative color design, and achieve an effective combination of font form and phoenix painting image. Taking font design as the starting point for innovative arrangement of graphic language, and finally using image design to present the inheritance and development of phoenix painting art images.



Figure 23. Color value of the work

4.2.2.2.3 Digital processing

According to the needs of the digital development of Anhui Phoenix Paintings, PS and AI were selected as image processing software. PS is currently a software used by many designers. It has powerful conveniences in image processing and can easily handle size, repair and other aspects of work. It also has a batch processing function, which can change a large number of identical images at the same time. image.

4.2.2.2.4 Digital finishing

Since the development of phoenix painting, because it is relatively old, the theme is relatively old and is not suitable for exhibitions and academic research. Therefore, the collected information should be digitally processed, and the patterns and colors of the information should be extracted, quantified, and reorganized. From the perspective of composition, the art of phoenix painting embodies the principles of unity of nature and man, balance of yin and yang, and symmetrical balance in traditional Chinese culture. In phoenix paintings, the coloring method is single-color flat painting with obvious outer contours. Just import the original picture into Ps, use the color picker tool to select a single color within the outline range, record the RGB value of the color, and create a phoenix painting color card.

When designing text, the lines, shape, size, color, etc. of the font need to be carefully considered to create a visual effect that is consistent with the design theme and emotional expression. The beauty of text can not only bring visual enjoyment and satisfaction, but also enhance the attractiveness and communication power of the work, and better convey the concepts and values of design. Therefore, for visual designers, the importance of text design is self-evident. It must not only have visual beauty, but also have emotional resonance, allowing people to feel deep emotions while viewing the design works. Resonant and human features.



Figure 24. Color manuscript of work illustrations

Through the analysis of the artistic composition of phoenix paintings, it is found that it is mainly composed of points, lines, surfaces, etc. From the perspective of color, the artistic colors of phoenix paintings have rich meanings and auspicious meanings. The colors used are mainly red, yellow and other warm colors; red represents auspiciousness and happiness; yellow represents wealth. Innovate the expression form of phoenix painting artistic images and realize the effective combination of font form and phoenix painting images.

The work was finally presented in the form of an image poster, and the design framework was constructed through the titles of the phoenix paintings, including "Dan Feng Chaoyang", "Hundred Birds Facing the Phoenix", "Hundred Birds Offering Longevity", "Belt to the Court", "Five Phoenixes" ", "Dragon and Phoenix Presenting Auspiciousness" and other work elements are combined and listed, and the image poster design is completed, innovating the expression form of the phoenix painting art image, so that the phoenix painting art image can be inherited and developed.

4.2.2.2.5 Digital presentation

This project not only achieves clear and easy-to-understand visual effects by digitally collecting the names of phoenix paintings and combining them with text design, but also produces works with aesthetic, artistic and emotional resonance. The work is completed using auspicious patterns. After the painting is completed, the work is applied to posters and red envelope covers. It has a festive and auspicious meaning, has a strong visual impact, and creates a fresh feeling that is different from the past.



Figure 25. Digital interactive mode of works

4.2.2.2.6 Achievements

First Prize in the Anhui Province Division of the 11th Future Division
National College Digital Art Design Competition



Figure 26. Work award certificate

4.2.2.3 Traces of the Wind: Innovative Design of Information Visualization from the Digital Humanities Perspective

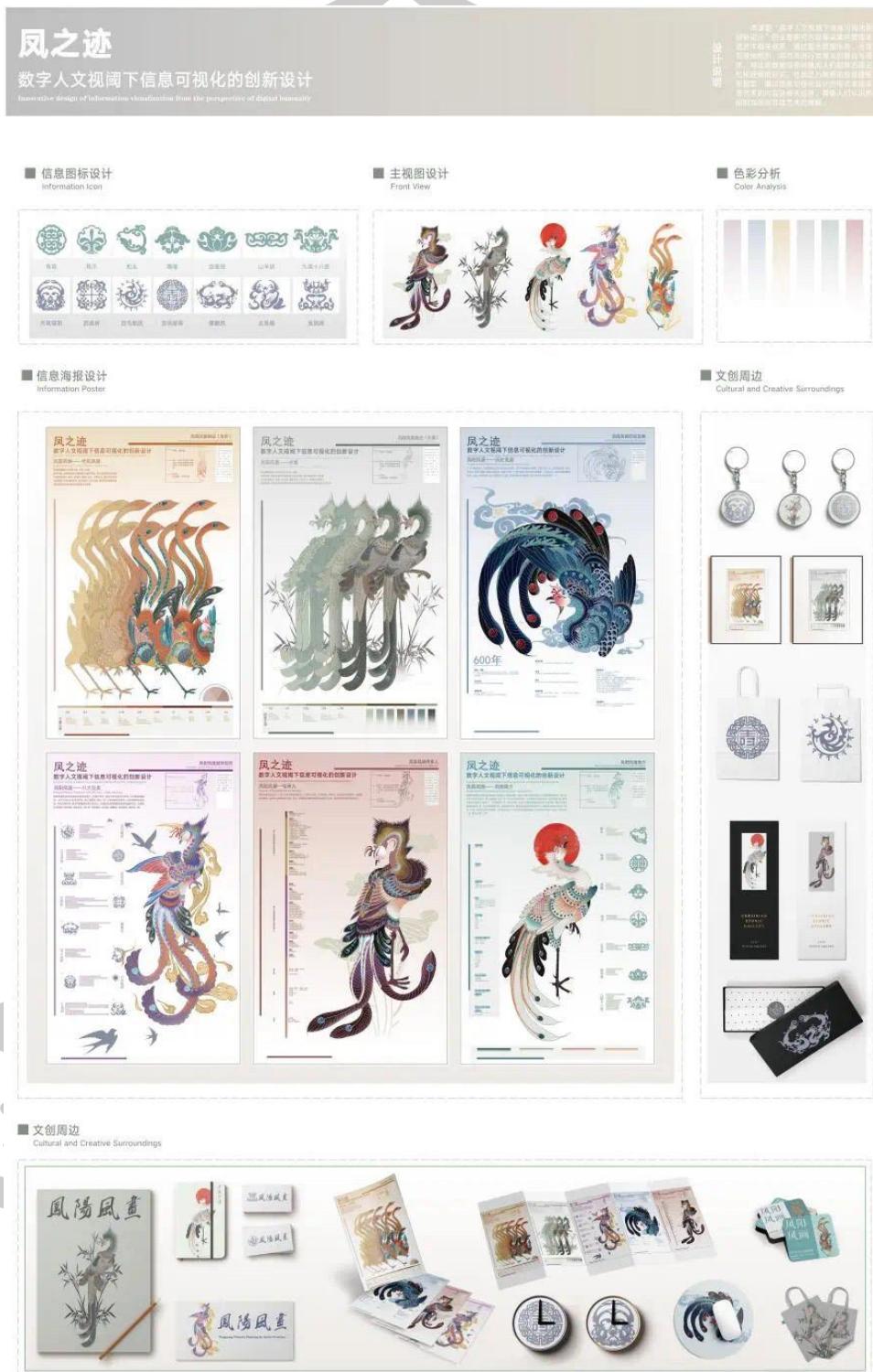


Figure 27. Pictures of works “traces of the Wind”

4.2.2.3.1 Design research

As shown in the picture (): Yun brocade is a unique cultural treasure of Nanjing. It represents the highest level of our country's weaving skills. This work takes Nanjing Yunjin brocade weaving technology as the main line, and uses information visual graphics and dynamic visualization as expression methods to present detailed information of Nanjing Yunjin brocade culture. Simply displaying physical objects in the exhibition hall cannot effectively spread knowledge or allow viewers to deeply understand the detailed information of Yunjin culture. The designer has built a new learning perspective to make the content of Yunjin culture more popular and concise. , intuitive, so that ordinary people can follow the designer's careful guidance to explore the story behind Yunjin. It is an interactive process, and it is also more conducive to the internalization of knowledge, leaving the viewer's own impression of Yunjin and generating their own unique understanding. .

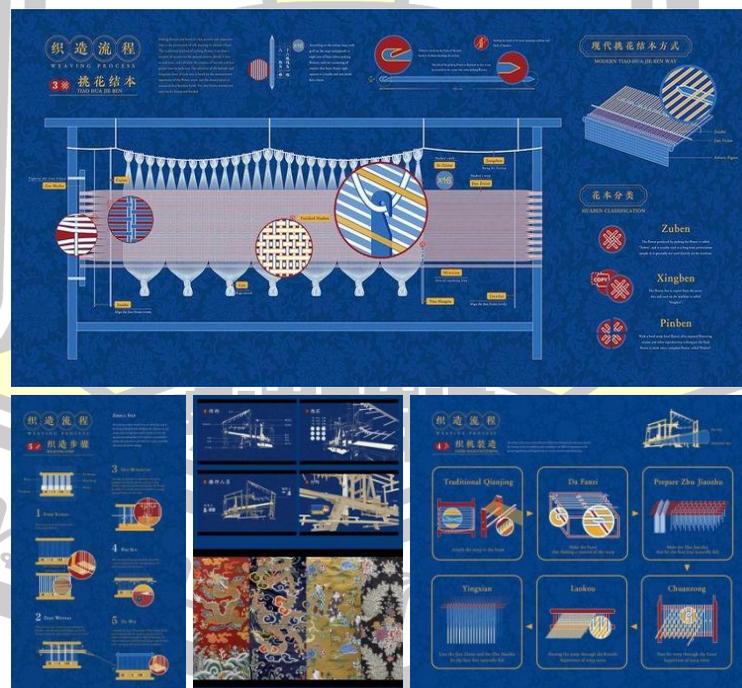


Figure 28. Nanjing Yunjin Information Visualization Design

As shown in the picture (28), Nine Chapters on Arithmetic is an ancient Chinese mathematics treatise. This book was written by Zhang Cang and Geng Shou and was written in the first century AD. It is a symbol of the complete system of ancient Chinese mathematics. The author uses information visualization design to guide the public to further explore "Nine Chapters of Arithmetic" and the thinking rules of ancient Chinese mathematics through information visualization design works based on the contents of charts. The information visualization work "Nine Chapters of Arithmetic" is the author Qi Tonghui's presentation of the classical Chinese content mentioned in the book "Nine Chapters of Arithmetic", including the mathematical knowledge points and concepts in the book, in the form of an information chart, in a clearer and more concise form. Reproduce the glory of ancient Chinese mathematics and display the essence of ancient Chinese mathematics.

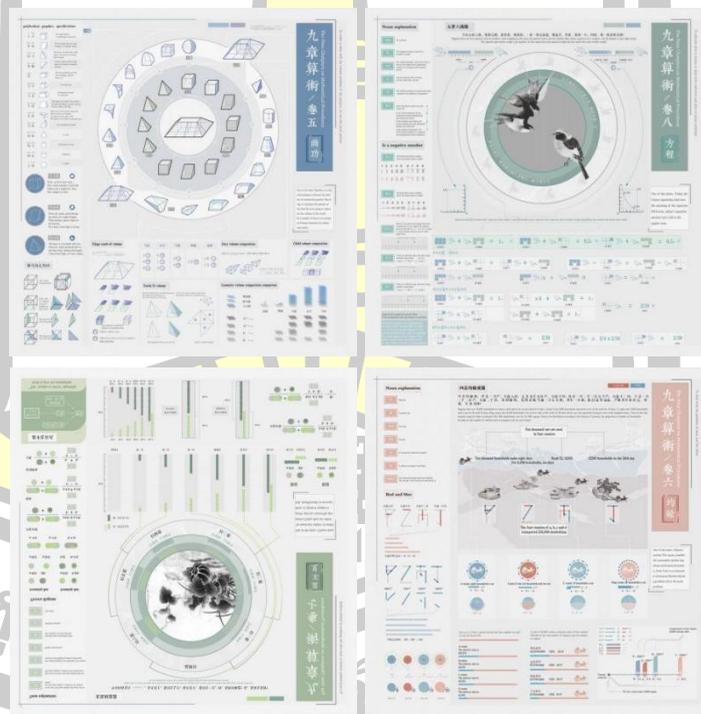


Figure 29. Nine Chapters Arithmetic

It can be concluded from this case that information visualization is a diagram-like expression used to organize, communicate and analyze information. It can help designers summarize complex information and visually display the relationships, processes and patterns of information. When data information is comprehensively presented, reasonable and beautiful visual presentation of confidence allows readers to filter out the necessary information from the huge amount of information and more accurately grasp the key points of the design. When organizing pictures, try to avoid using too much text, and use a combination of graphics and text to convey information, reduce reading costs, and at the same time show better reading effects.

4.2.2.3.2 Digital collection

As shown in the picture () of the series of phoenix painting works, design research and information collection were carried out with the art of Anhui phoenix painting as the center. Information and excellent cases of Anhui phoenix painting were collected through search engines, social media and other channels. From the development context, painting techniques, collecting textual information on inheritance characters, theme introduction, picture elements, place of origin, etc. is the main data source for the design of infographics for this project. We collected the representative works of Anhui Phoenix Painting artists, digitized them, and annotated the relevant information to form a complete set of Anhui Phoenix Painting infographic designs.

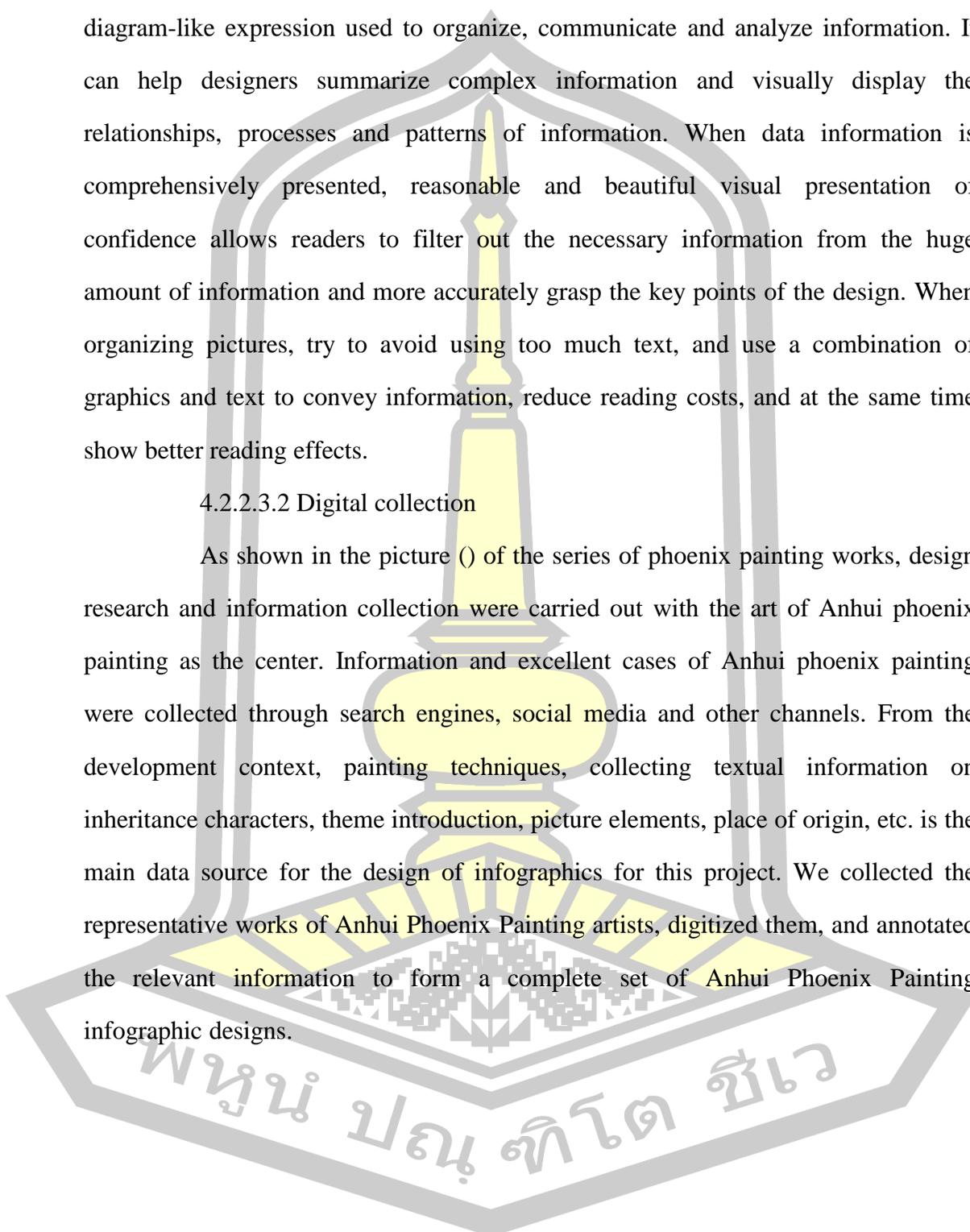




Figure 30. series of phoenix paintings

4.2.2.3.3 Digital processing

Referring to the collected phoenix paintings, collect relevant information about Anhui phoenix paintings, and complete the drawing of the main view of the information chart on procreate software.



Figure 31. Phoenix element main graphic arrangement

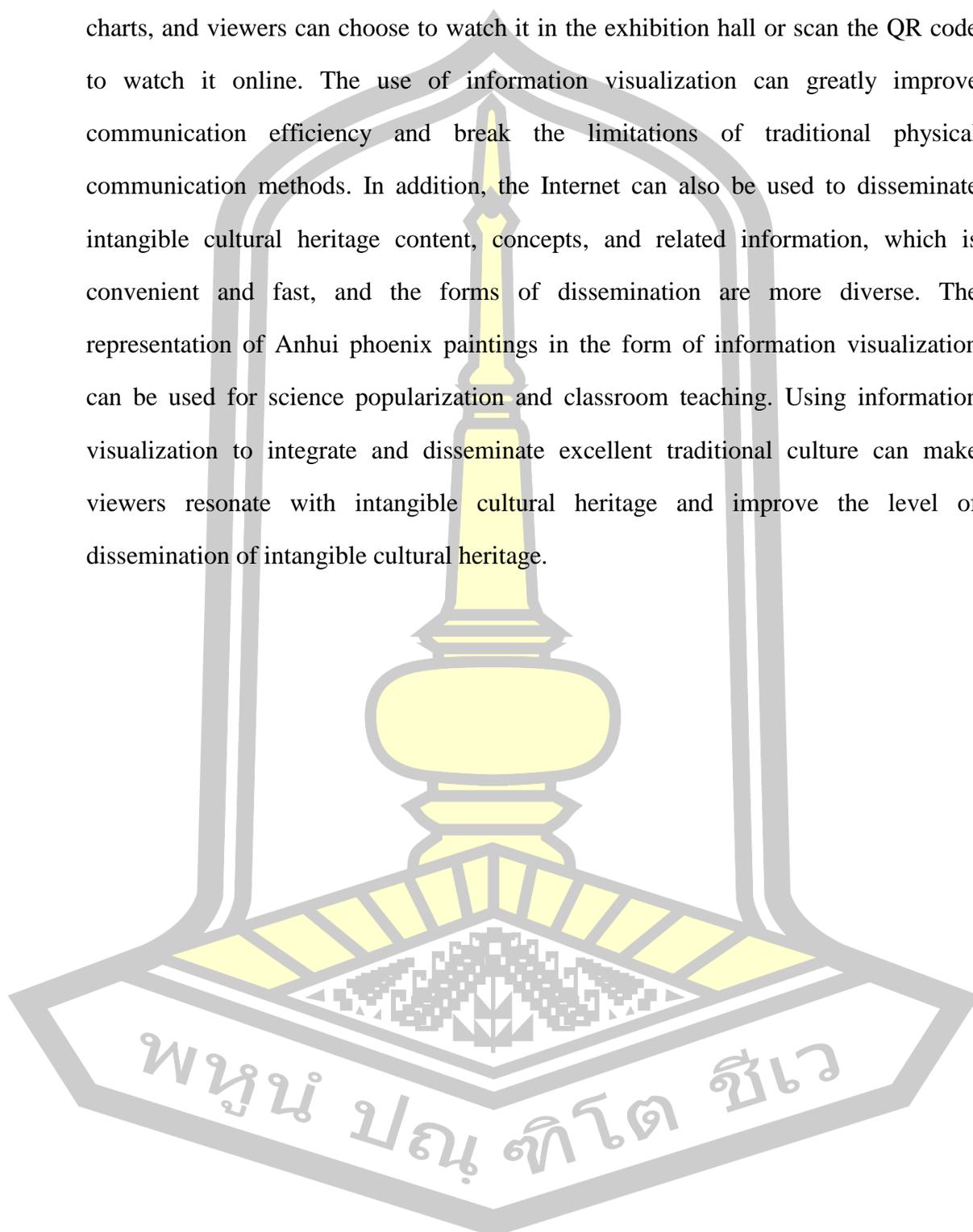
Table 10. Representative Inheritors of Each Dynasty table

Anhui Phoenix Painting Art: Representative Inheritors of Each Dynasty	
Ming Dynasty	Zhu Yuanzhang named his hometown "Anhui". Anhui means "Danfeng Chaoyang", which is the livelihood of the palace noodle chef.
Qing Dynasty	Tang Chuansheng--"Danfeng Chaoyang"
Republic of China	(Anhui phoenix paintings took shape in the late Republic of China) Wang Tong, Doctor Liu, Hua Rongsheng (father: Hua Cunen)
contemporary	Yin Pai-Yin Maoan (father)-Yin Jiecheng (son) Huapai-Hua Rongsheng (deceased), Hua Xiancai (deceased), Wang Dexin (deceased) Direct disciple-Cao Xiucheng-(disciple) Lu Zhongke Tang Feng Wu Dechun-(apprentice) Xie Dongmei, Zhang Qin (daughter), Hou Junhui, Tang Zhiqin, Jin Xingfu Wu Wenjun Wang Jinsheng Tu Weiliang (deceased) - (apprentice) Feng Xuerong, Zhuo Li, Liu Mengjie Zhang Weiwu

4.2.2.3.4 Digital organization

The work was finally presented in the form of an information chart, including six information visualization charts with themes of development, painting techniques, inheritance figures, theme introduction, picture elements, and place of origin. During the design process, two softwares, procreate and AI, were used in the specific production. The main view of the information chart and related information icons were drawn on procreate, typed on AI, and the digitalized phoenix painting was used as the main view, related information and elements. Icons are arranged around

the main view. The work is finally presented in the form of information visualization charts, and viewers can choose to watch it in the exhibition hall or scan the QR code to watch it online. The use of information visualization can greatly improve communication efficiency and break the limitations of traditional physical communication methods. In addition, the Internet can also be used to disseminate intangible cultural heritage content, concepts, and related information, which is convenient and fast, and the forms of dissemination are more diverse. The representation of Anhui phoenix paintings in the form of information visualization can be used for science popularization and classroom teaching. Using information visualization to integrate and disseminate excellent traditional culture can make viewers resonate with intangible cultural heritage and improve the level of dissemination of intangible cultural heritage.



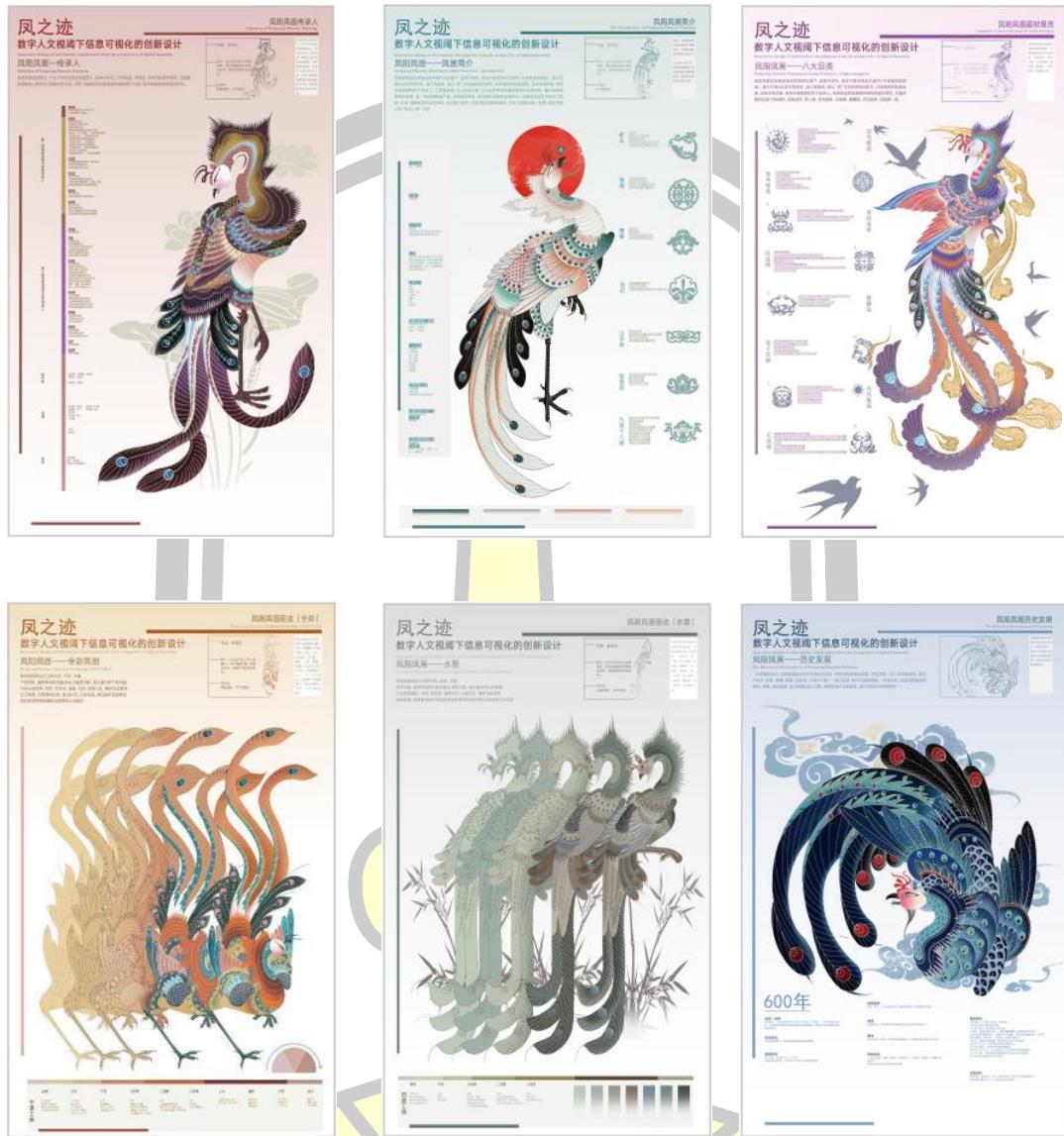
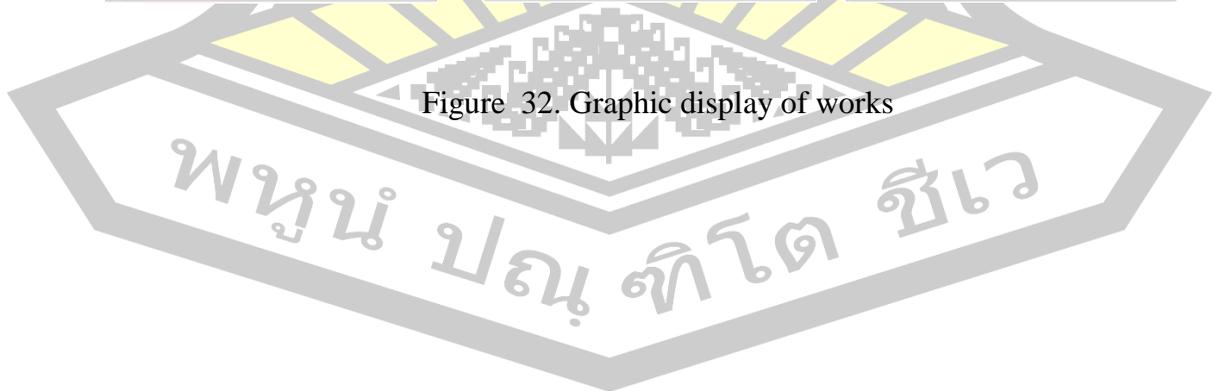


Figure 32. Graphic display of works



4.2.2.3.5 Achievements

First Prize in the National Finals of the 11th Future Designer National College Digital Art Design Competition



Figure 33. Work award certificate

4.2.2.4 Yuanfeng·Zang: Narrative interactive practice and application of picture book design in the era of digital intelligence



Figure 34. Pictures of works “Yuanfeng·Zang”

This topic is based on "Narrative interactive practice and application of picture book design in the digital intelligence era". In today's era, there is a large vacancy in the domestic market for original picture books, and at the same time, there is a huge domestic demand for picture books. Most of the picture books on the market are popular science books or picture books with themes such as traditional culture, patriotic education, legends and mythology. However, there is a blank in terms of folk art and folk art. This project uses Anhui Phoenix Painting, an intangible cultural heritage of folk art, as the basis for creation, to spread domestic folk culture and promote intangible cultural heritage.

4.2.2.4.1 Design research

4.2.2.4.1.1 Research on picture book content

As shown in the (35) series of classic phoenix paintings, this project extracted the theme elements of classic paintings in the process of researching the intangible cultural heritage Chuzhou Anhui phoenix paintings.



Figure 35. series of classic phoenix paintings

4.2.2.4.1.2 Picture book design style research

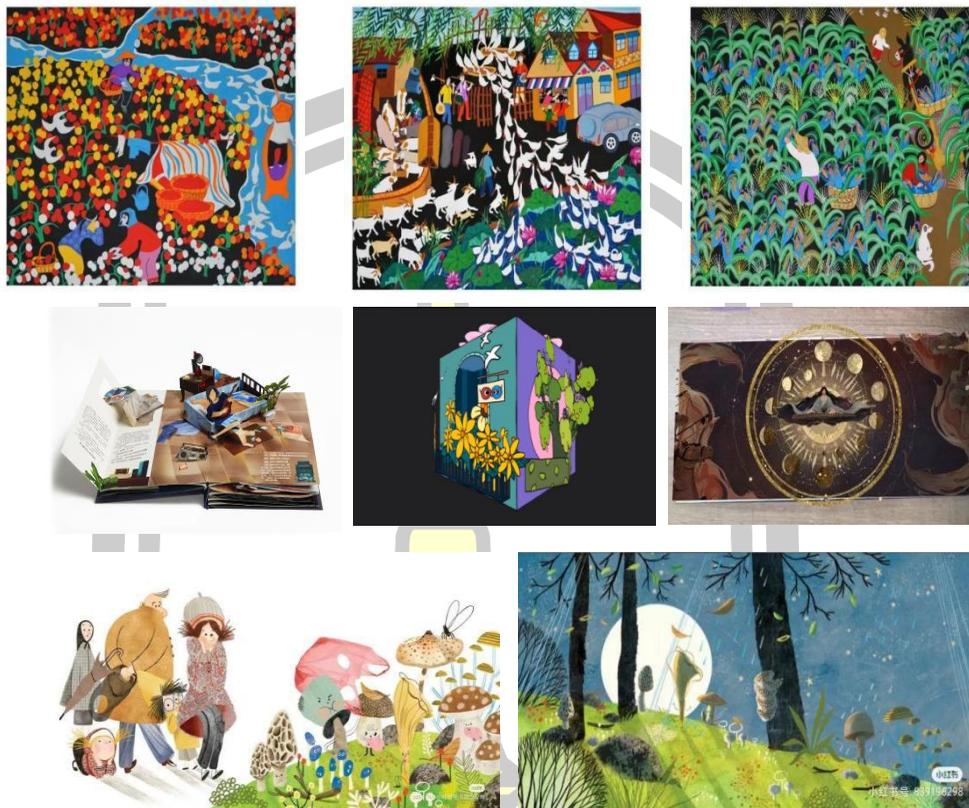


Figure 36. Work reference cases

4.2.2.4.2 Digital collection

This project will use traditional Anhui phoenix paintings with unique themes, including: Danfeng Chaoyang, Hundred Birds Facing Phoenix, Five Phoenix Tower, Five Lun Tu, Hundred Birds Offering Longevity, and Four Fan Screens to create and collect works.

4.2.2.4.3 Digital processing

In the digital processing of this topic, Photoshop, Procreate, Art studio and other electronic painting software are used to draw story illustrations, and Photoshop and Illustrator are used for picture book layout. Finally, software such as Photoshop, Playground, and Mental canvas are used to achieve electronic interaction.

4.2.2.4.4 Digital finishing

This topic is based on "Narrative Interaction Practice and Application of Picture Book Design in the Digital Intelligence Era" as the research content. It takes the digital intelligence era as the background, picture book design as the carrier, and narrative interaction as the presentation method to carry out research and application. The specific contents are summarized and organized as shown in Table (12).

Table 11. Work creation summary table

Theme	Danfeng Chaoyang	Danfeng is good	Four screens	Five Lun Diagram	Hundreds of birds paying homage to the phoenix	Wufeng Tower
story	Folklore stories of Anhui City	On the phoenix's birthday, all the birds come to wish it a happy birthday	A day's activity in Phoenix includes "flying, singing, eating and lodging"	The five moral principles between father and son, monarch and minister, husband and wife, elder and young, and friends	When the forest is dry, the phoenix uses the fruits it has accumulated to help the birds in the forest.	Folklore stories of Phoenix Mountain
format	210mm*420mm					
Number of pages	6pages	4pages	4pages	10pages	6pages	8页
style	Chinese traditional folk painting (peasant painting) style					
color	#417c76	#635d97	#b8af54	#e11041	#e1c1c1d	#9290e8

	#e2a14f	#dd986b	#a2c6df	#1c75ac	#89a4a4	#e4806a
	#f7e054	#5d4d46	#798d8f	#8fb68f	#a5a5a2	#82ce8b
	#cb4f59	#c6c66b	#c3bf9a	#ecaf65	#A9bab9	#a6978a
interacti ve mode	Three-dimensional books, electronic imaging AR interaction					

4.2.2.4.5 digital presentation

4.2.2.4.5.1 Digital plane effect presentation: Use electronic software to draw and present the final plane effect scheme of the work. Part of the display is shown in Figure (37).



Figure 37. Part of the completed draft of the picture book

4.2.2.4.5.2 Physical effect presentation: When this topic "Narrative Interaction Practice and Application of Picture Book Design in the Digital Intelligence Era" is applied to paper narrative interactive three-dimensional books, the opening and closing of the book is used to interact between the reader and the story. As shown in Figure 3-10. When applied to electronic interactive books, mobile

devices such as iPads, smartphones, etc. are used to scan the book story illustration content, and the electronic three-dimensional AR interactive works are finally presented through designated software as a carrier. as the picture shows.

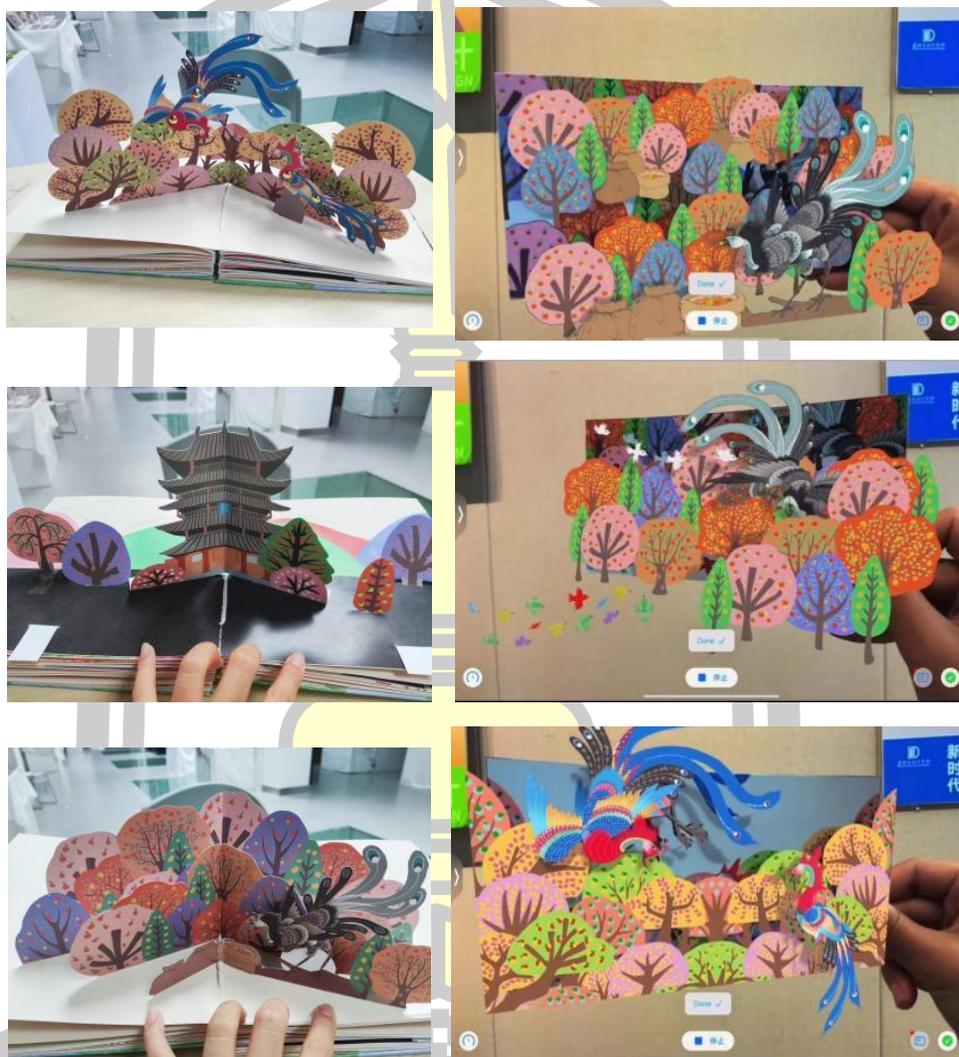


Figure 38. paper three-dimensional interaction

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4.2.2.4.6 Achievements

Third Prize of China Good Creativity (17th) and National Digital Art Design Competition



Figure 39. Work award certificate

4.2.2.5 Chufeng·Qing: Innovative design practice and application of dynamic graphics based on emotional expression



Figure 40. Pictures of works “Chu feng· Qing:”

This topic "Practice and Application of Innovative Design of Dynamic Graphics Based on Emotional Expression" uses dynamic graphic design presentation methods to let more audiences understand and understand Anhui Phoenix Painting and inject new vitality into Anhui Phoenix Painting. Through the investigation and research of this topic, it can be concluded that dynamic graphic design currently has good prospects for promoting cultural dissemination and development. It is understood that the country is constantly paying attention to the development of traditional culture, and there are also cases of integrating traditional culture into dynamic graphic design in China. , a case for promoting cultural development. Moreover, the investigation of the provincial intangible cultural heritage found that the innovation ability of promoting Anhui Phoenix paintings in Anhui Province is relatively weak, the cultural level needs to be improved, the scope of dissemination is not wide enough, and the method is not novel enough, so Anhui is selected for this project. Phoenix paintings are the creative content, and the innovative design approach of dynamic graphics is used to present and promote Anhui phoenix paintings, which is conducive to the development and protection of Anhui phoenix paintings. Therefore, this creation is an innovative design and practice of dynamic design based on graphic language based on Anhui Phoenix Painting.

4.2.2.5.1 Design research

This topic "Practice and Application of Innovative Design of Dynamic Graphics Based on Emotional Expression" takes emotional expression as the design concept and dynamic graphics as the main body. In the development and process of society, many intangible cultures have been inherited to this day. With the development of economy, people's material life is colorful, but spiritual civilization is increasingly scarce. Anhui Province plays an important role in the history of our country and is located in the Yangtze River Delta in East China. Anhui is one of the sources of Chinese civilization. There is a Anhui Phoenix painting around Chuzhou

City in Anhui Province that has been included in the provincial intangible cultural heritage. This project adopts the innovative design of dynamic images based on emotional expression. Through the dynamic transformation and transition of graphics, dynamic graphics are used as the main elements and text is used to assist, so that people can understand the development and evolution of Anhui Phoenix Painting.

Compared with traditional static design, dynamic visual expressions can convey richer information and allow people to feel the auspicious and beautiful meaning of life brought by Anhui Phoenix paintings. Secondly, it not only enriches the visual language of Anhui Phoenix but also enhances its visual impact, allowing for better visual and emotional interaction with viewers. As far as the audience is concerned, in the process of visual experience, the audience can not only satisfy their visual needs, but also satisfy their psychological needs. Therefore, based on emotional expression, Anhui Phoenix can be displayed in the audience's field of vision in a new way. For the inheritors, Anhui Phoenix Painting is disseminated and promoted through a new carrier, adding a new way of inheritance to spread the intangible cultural heritage and embody the artistic value of Anhui Phoenix Painting from a new perspective. This subject uses the expression form of dynamic graphic design, combines it with contemporary aesthetic requirements, and injects new artistic concepts and aesthetic styles. It not only plays an important and positive role in developing innovative industries in Anhui area, but also increases its visibility and provides a new development direction for its inheritance and innovation in contemporary society.

With the development of the times, many excellent intangible cultural heritage products continue to emerge. Many intangible cultural heritage products use the Internet, mobile phones and other media to quickly transmit information using daily mobile phones. With its highly innovative, novel form and dynamic graphic design that conveys emotions, it will be sought after by the masses, and it will be

easier to convey people's emotional color towards Anhui Phoenix Painting. Among them, these annual dynamic design works demonstrate the combination of creativity and technology to create cutting-edge visual scenes. The MG animation in the McDonald's 2023 Spring Festival paper-cut style has caused a wave of popularity. At the same time, Reflex Design of Holiland Market designed a market promotion animation to allow customers to immerse themselves in the theme of "market".



Figure 41. McDonald's "celebrates the Chinese New Year with great success"

A promotional advertisement jointly produced by McDonald's and Shanghai Art Film Studio to promote McDonald's new product display during the Spring Festival. McDonald's Spring Festival animation is booming during the Chinese New Year. This work was inspired by family reunions during the Spring Festival. The whole story uses "spring bamboo shoots" throughout the animation as a transition form. It tells the scene of a family reunion during the Spring Festival. The animation includes parts of a McDonald's hamburger to promote the launch of McDonald's new Spring Festival products. The designer uses spring bamboo shoots as creative elements and uses paper-cut techniques to express the character's clothing. The hat decoration is integrated into the traditional cultural elements of the Spring Festival, and finally integrated into the traditional Chinese painting frame. The overall picture is bright and childlike, and the background color is in the form of gold foil and red paper, the raw material of paper-cutting, making it even more charming. Such dynamic works can not only stand out from the crowd of cultures, catch consumers'

attention, and promote McDonald's Spring Festival limited products; they can also tell folk stories, which are cultural, interesting and ornamental, as shown in Figure (41).

Holiland Market is a bakery and dessert themed store with a flea market concept. The designer created a promotional animation for the market to allow customers to immerse themselves in the Holiland Market theme, as shown in the figure (42).



Figure 42. Holiland Market "ReflexDesign Conditional Reflection"

4.2.2.5.2 Digital collection

The purpose is to promote Anhui Phoenix Painting and promote the intangible cultural heritage of Anhui Province. Combining Anhui phoenix paintings with dynamic graphics, through dynamic design methods, these paintings are displayed vividly and interestingly, new dynamic forms are displayed through various media, and applied to mobile phone display interfaces. Field collection of Anhui phoenix paintings is the first priority. Standard processing of graphics collection, audio, and video in Anhui Phoenix Painting. In addition, the original works of Anhui Phoenix paintings should be decomposed and reshaped. At the same time, appropriate colors and highly identifiable pattern elements should be collected and selected to avoid excessive deviations from the original works. Historical records can be obtained by consulting books or searching the Internet. The drawing tools used in the work must use Adobe Photoshop and Adobe Illustrator as image processing software to

ensure the accuracy and clarity of the material. The collected raw materials are easy to integrate and process.

4.2.2.5.3. Digital processing

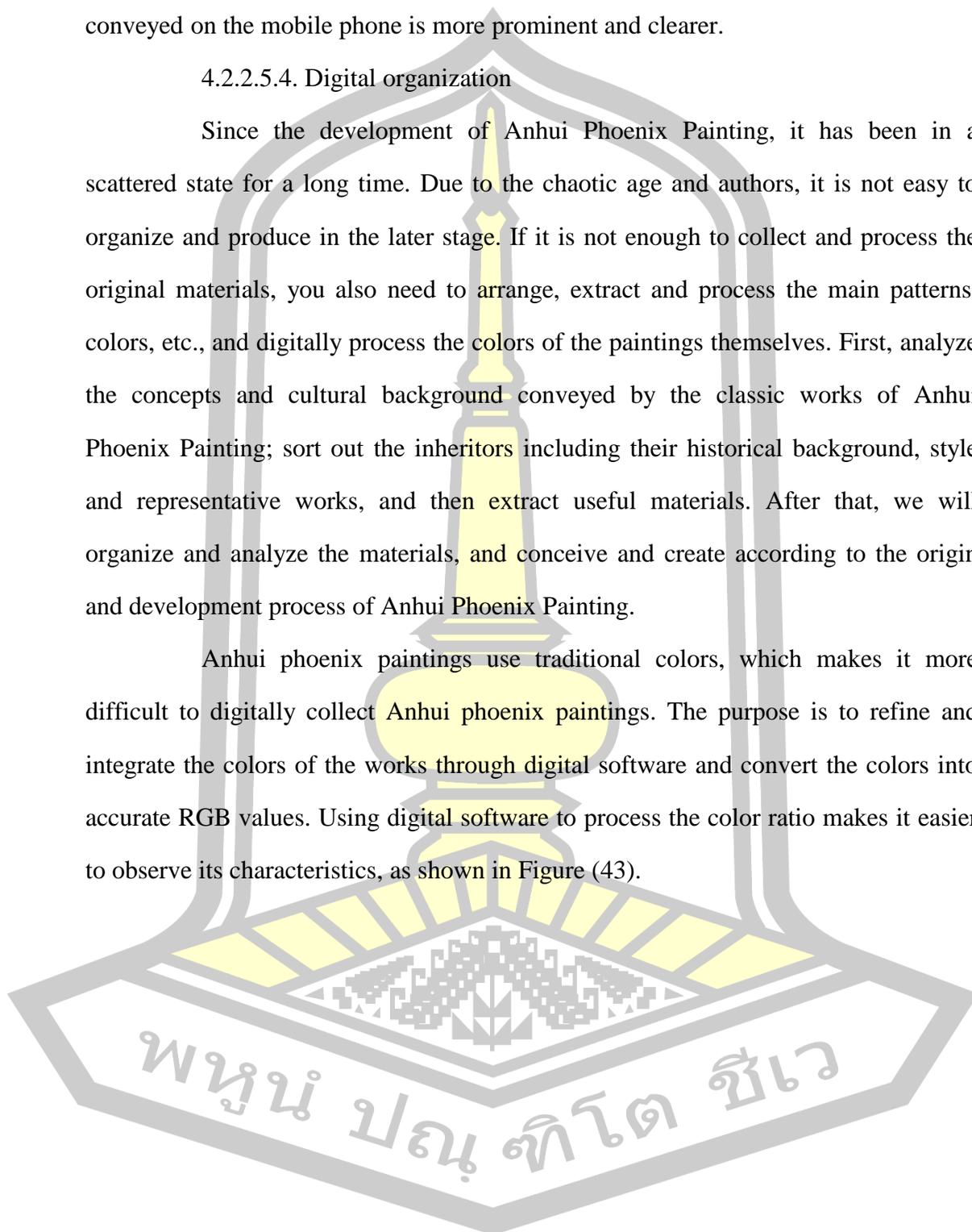
The collected Anhui phoenix paintings are digitally processed for production and preparation for the next step, which mainly involves the simplification, arrangement and reorganization of the original materials. The information searched on the Internet is converted into graphic tables through equipment for reference. At the same time, in order to avoid confusion in chronological order, the works are arranged and designed according to the development history, development status, basic drawing methods and development trends of phoenix paintings. Search audio and video for audio that is suitable for the subject matter, and sort out materials suitable for viewing on the mobile interface. Key considerations also need to be taken into consideration, such as the size, dimensions, resolution, transitions, etc. of the material collection. In addition to computer hardware support, dynamic production and video and audio processing software are also required. For the selection of digital software, according to the needs of this topic, select Adobe Illustrator, Adobe After Effects, and Adobe Premiere. Adobe Illustrator is a vector graphics file processing software that outputs images at the highest resolution at any size, and most file formats can be used directly. The advantage of vector images is that they can be reduced and enlarged without limit, which is very suitable for the drawing of this topic without compromising accuracy. Premiere and Aftereffects are video digital processing software. They use plug-ins to transfer graphics drawn by Adobe Illustrator to Aftereffects with one click. At the same time, the graphics are rotated, zoomed in and out in Aftereffects, and the emotions to be expressed visually are conveyed. At the same time, after post-editing and editing of the work's technological process, classic works, historical background

and other materials, the emotional content to be expressed when the information is conveyed on the mobile phone is more prominent and clearer.

4.2.2.5.4. Digital organization

Since the development of Anhui Phoenix Painting, it has been in a scattered state for a long time. Due to the chaotic age and authors, it is not easy to organize and produce in the later stage. If it is not enough to collect and process the original materials, you also need to arrange, extract and process the main patterns, colors, etc., and digitally process the colors of the paintings themselves. First, analyze the concepts and cultural background conveyed by the classic works of Anhui Phoenix Painting; sort out the inheritors including their historical background, style and representative works, and then extract useful materials. After that, we will organize and analyze the materials, and conceive and create according to the origin and development process of Anhui Phoenix Painting.

Anhui phoenix paintings use traditional colors, which makes it more difficult to digitally collect Anhui phoenix paintings. The purpose is to refine and integrate the colors of the works through digital software and convert the colors into accurate RGB values. Using digital software to process the color ratio makes it easier to observe its characteristics, as shown in Figure (43).



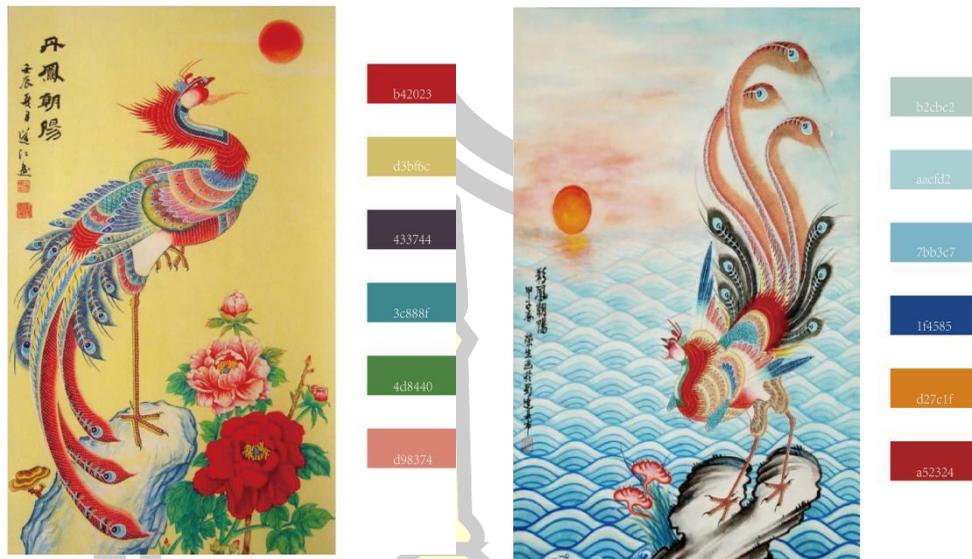


Figure 43. "Dan Feng Chaoyang" "Colorful Phoenix Chaoyang" color extraction

4.2.2.5.5. Digital presentation

This project aims at the digital collection of Anhui Phoenix painting graphics and patterns, and basically determines the drawing of dynamic graphics. The basic Anhui Phoenix dynamic graphics resource database is searched based on the Anhui Phoenix resource database. The development process of Anhui Phoenix Painting is drawn using the expression of dynamic graphic language, and the display form is displayed through sketches and finished products. After the painting is completed, the work will be applied to the mobile client in the form of a vertical screen. The illustrations in the video will be displayed peripherally, which has strong artistic expression. as the picture shows.

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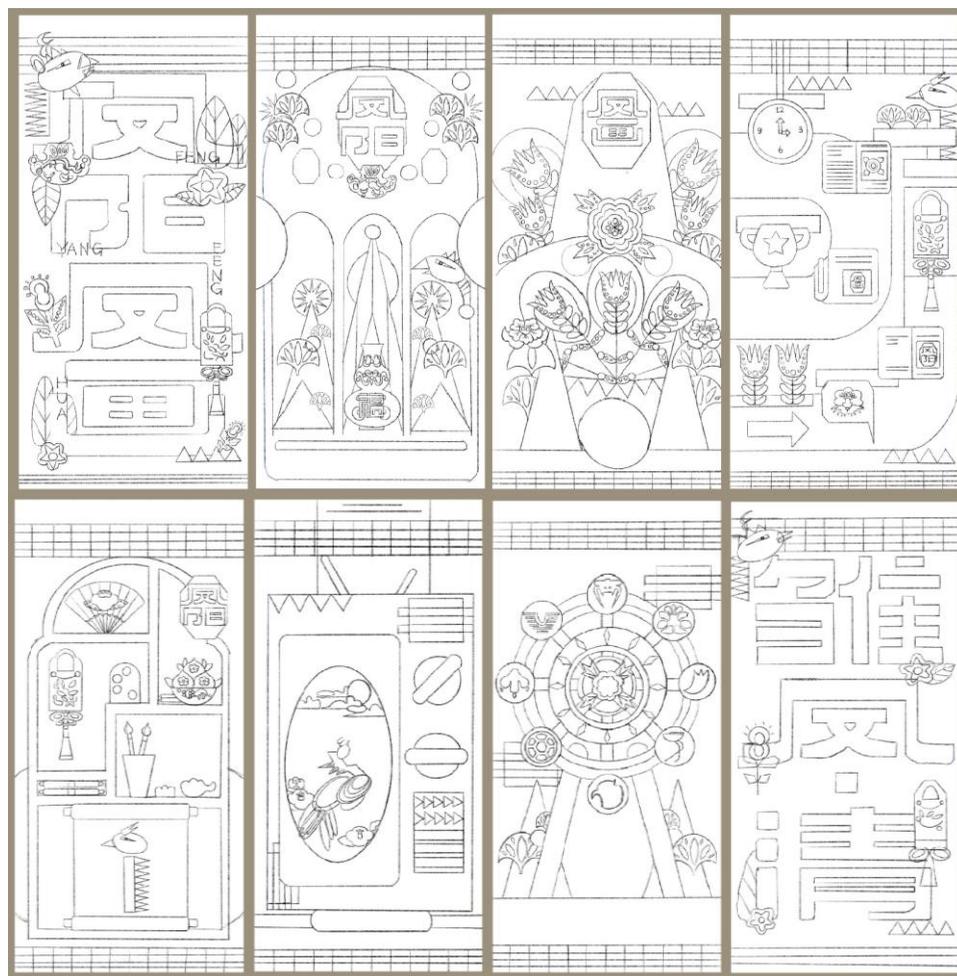


Figure 44. Sketch display

The design is based on the extraction of classic elements from Anhui Phoenix paintings and is designed in a deconstructed form. Use simple circles and squares for presentation. Picture (44) respectively shows the beginning of the film and the introduction of the theme; the origin of phoenix painting, originating from Anhui; the meaning of auspiciousness, the hometown of dragons and phoenixes; the development process and award-winning experience. as the picture shows.



Figure 45. Color draft of the work

The design is based on the extraction of classic elements from Anhui Phoenix paintings, and is designed in a deconstructed form. Use simple circles and squares for presentation. Picture (45) respectively shows the introduction of tools and

the drawing process; the classic work, Dan Feng Chaoyang; the image characteristics, digital display; Chu Fenagling, the name of the work. as the picture shows.

Based on the interpretation of Anhui's phoenix paintings, the distinctive elements in the works were extracted and designed using the composition of points, lines and surfaces. Extract image features such as peonies, roses, and pine trees. Drawing on the colors of phoenix painting art for design, it reflects a strong sense of design. as the picture shows.



Figure 46. Work interactive sce

4.2.2.6 Zhiyu: Information interaction design of phoenix painting art images in the digital era

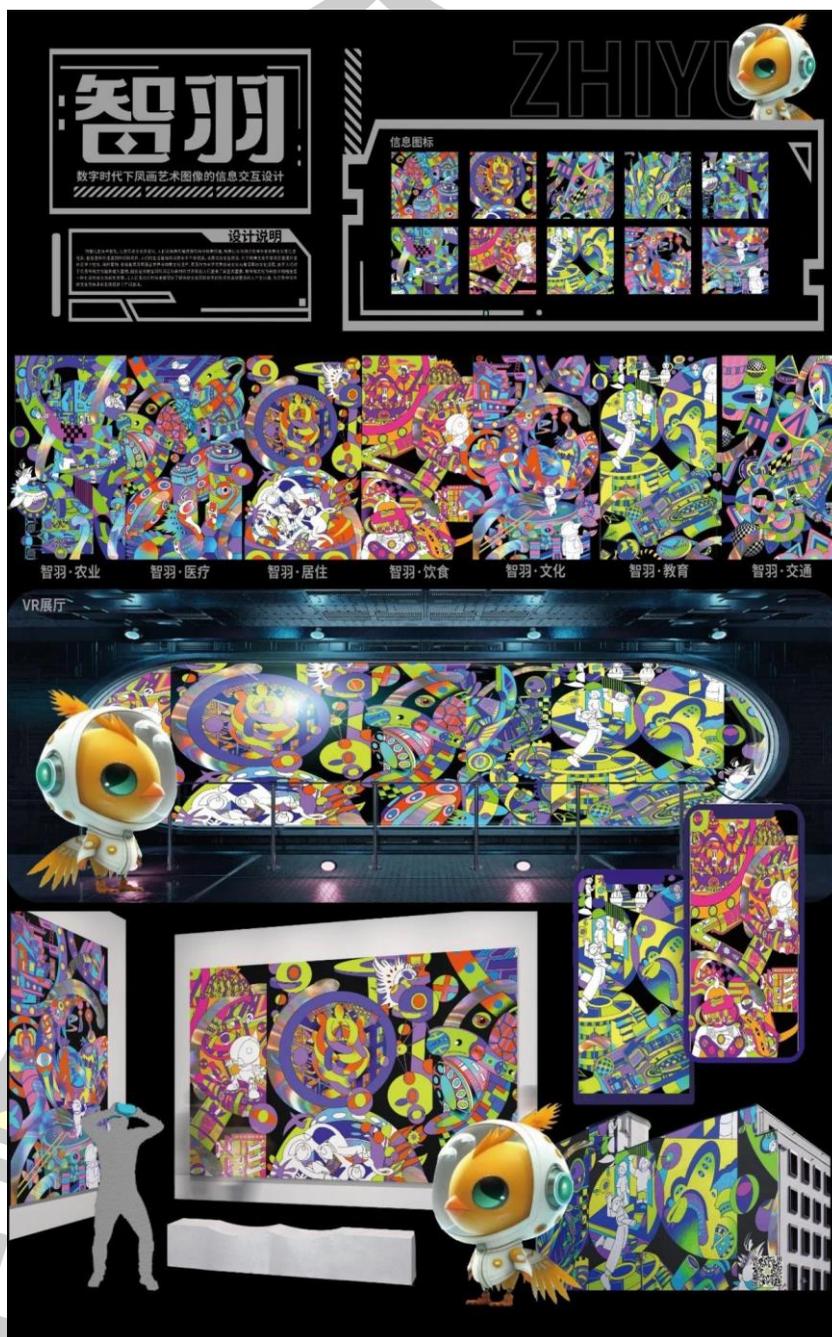


Figure 47. Pictures of works “Zhiyu”

In the digital age, the charm and significance of phoenix painting art can be conveyed and displayed on a wider scale. The information interaction design of Anhui

Phoenix art images in Anhui Province must consider user needs and utilization purposes. The purpose of this project design is to realize the digital presentation and information transmission of phoenix painting art images. Digital presentation enables the phoenix painting art images to be displayed on more terminal devices and applications, so that more people can understand and learn the charm of phoenix painting art and cultural connotation. At the same time, the application of digital technology also provides new ways and means for the protection and inheritance of phoenix painting art. Secondly, why do we do it? The particularity and advantages of digital signals and information have given new value and meaning to traditional art forms. Anhui Phoenix Painting in Anhui Province is one of the traditional arts. If it only stays in the traditional way, it will be difficult to further promote and inherit it. Therefore, digital presentation and information interaction design have brought new opportunities and challenges to the inheritance and development of phoenix painting artistic images. How to do it in the end? The specific design process requires comprehensive consideration of several factors. At the beginning, it is necessary to conduct an overall design plan, formulate a plan for digital collection and processing, and consider data sorting, classification, and standardization. Then we need to use new digital technologies, such as VR and AR, to better display the art form of phoenix painting. When it comes to the presentation of digital information, designers need to understand the needs and purposes of users and choose the platform and form of digital presentation to achieve the best information transmission effect. At the same time, in the process of digital presentation, it is necessary to consider the interactive design with users and explore more user experience and interaction methods, so as to better present the cultural connotation and unique charm of phoenix painting art. To achieve the goal and significance of better protecting, inheriting and promoting the art of phoenix painting.

4.2.2.6.1. Design research

The focus of this design investigation is to comprehensively collect original information about Anhui Phoenix Paintings. First of all, a large amount of relevant information was collected through the Internet, including the collection of artistic images of Anhui Phoenix , the collection of audio and video, etc. In the process of collecting and organizing the data, these materials are presented in two forms: text introduction and images. The data collected are mainly focused on the history, current situation and content of Anhui Phoenix Painting art, as well as the detailed process of Phoenix Painting production process. The collection of these materials is of great help in understanding the basic overview of Anhui Phoenix Painting and in-depth understanding of the cultural connotation of Phoenix Painting. In addition, the collection of images makes it easier to extract relevant pattern elements, etc., providing a basis for subsequent digital processing. At the same time, a series of pictures of related scenes such as clothing, food, housing, and transportation in the current and future lives are collected. The purpose of this is to establish life scenes and situations about Anhui Phoenix Painting in the future, better integrate Phoenix Painting culture with modern life, and satisfy the aesthetic desires and cultural needs of modern people. During the research process, it is also necessary to collect and sort out the impact and historical changes of Anhui Phoenix Painting on local culture, as well as its meaning on customs and etiquette. The collection of these materials is very instructive for the information interaction design of Anhui Phoenix art images, and can better make the digital design closer to the cultural connotation of Phoenix. In short, this design research work mainly focuses on collecting relevant data and information about Anhui Phoenix. The information collected covers the history, current situation, content and production technology of phoenix painting art. It also collects relevant information such as life scenes and the meaning of phoenix paintings. The collection of these materials provides the basis and guidance for the

subsequent formulation of digital processing and information transmission design plans.

4.2.2.6.2. Digital collection

The main task of digital collection is to materialize Anhui Phoenix artworks into digital images, making them easier to digitally process and present. During the digital acquisition process, it is necessary to focus on the original data of the artwork, such as color, artist, graphics, etc. First, color collection is carried out. The color characteristics of Anhui Phoenix paintings are one of the important components of the works of art. Recording the true colors of the artworks and presenting them digitally can better preserve the visual language characteristics of Anhui paintings. Color acquisition was performed via Adobe Photoshop palettes. The advantage of palettes is the ability to record more color layers and detailed features. Next, the artist record is carried out. The artist record refers to recording the artist information of the phoenix painting artwork, including the author's name, creation year and other elements. This information has important reference value for subsequent art and culture research.

In this digital collection, the artist information of Anhui Phoenix art works was recorded through manual input. Finally, graphics collection is realized, which is a key link in digital collection. Also use Adobe Photoshop to use the magic wand or selection tool to select the captured image. Draw the edges of the required pattern and then capture the image to achieve digital capture. Recording the texture, shape and detailed features of artworks helps to improve the accuracy and completeness of digital information. After the collection is completed, the digital data is stored in a folder, and data integration and classification strategies are fully considered to make the digital data more convenient and quickly processed and exploited.

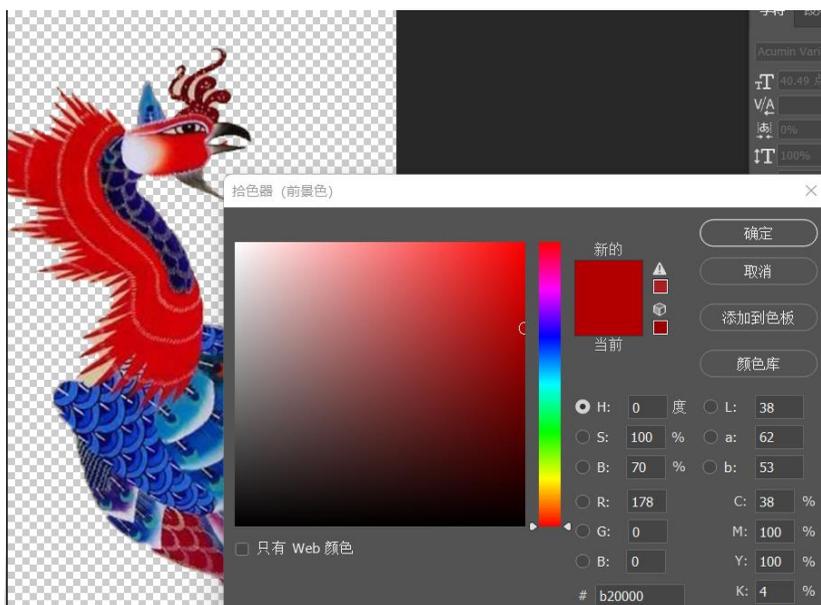


Figure 48. Color value of the work

4.2.2.6.3. Digital processing

The main task of digital processing is to filter and combine the digitally collected phoenix painting art pictures, and to combine and arrange the information elements in the digital collection library that will be used in subsequent designs, so that the graphic collage is formed in the repetitive process of combining and breaking. The compositional picture enables it to be better presented with the subsequent interactive design. The relevant content of this digital processing involves the combination of phoenix paintings, food, clothing, housing and transportation with future scenes, the classification and analysis of Anhui phoenix paintings, and the combination and splicing of main patterns and color elements. It also involves future life scenes such as planting and medical treatment. Education and other related scenes will have elements for extraction. Digital processing conducts in-depth exploration and analysis of phoenix paintings. By combining phoenix paintings with scenes of clothing, food, housing, transportation, etc., we can better integrate phoenix paintings with modern life and increase the practical value of the works. and cultural connotation. In order to make the phoenix painting pattern better integrate into

modern life scenes, it is necessary to further simplify the edge processing of the phoenix painting artwork. The purpose of combining the collected phoenix painting pictures is to make these pictures correspond to actual scenes such as food, clothing, housing and transportation. After information collage and digital processing of these pictures, sketches can be drawn, and deformed and reassembled through application software such as Photoshop. After repeated combinations, cutout analysis can be used to extract and classify each element appropriately.

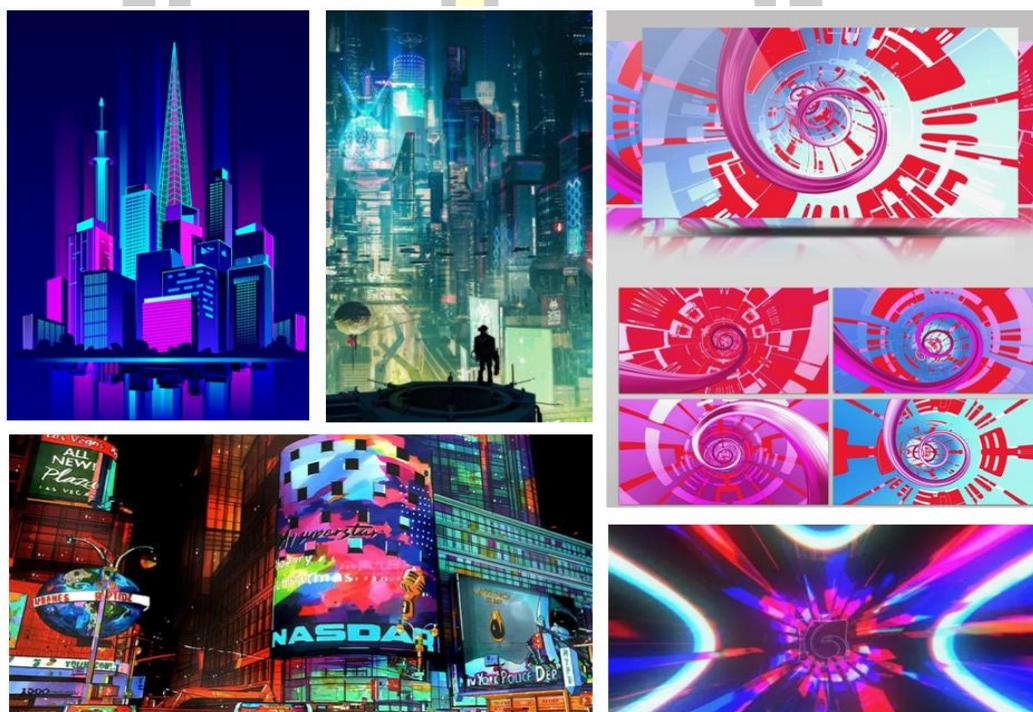


Figure 49. Future scene element combination screen

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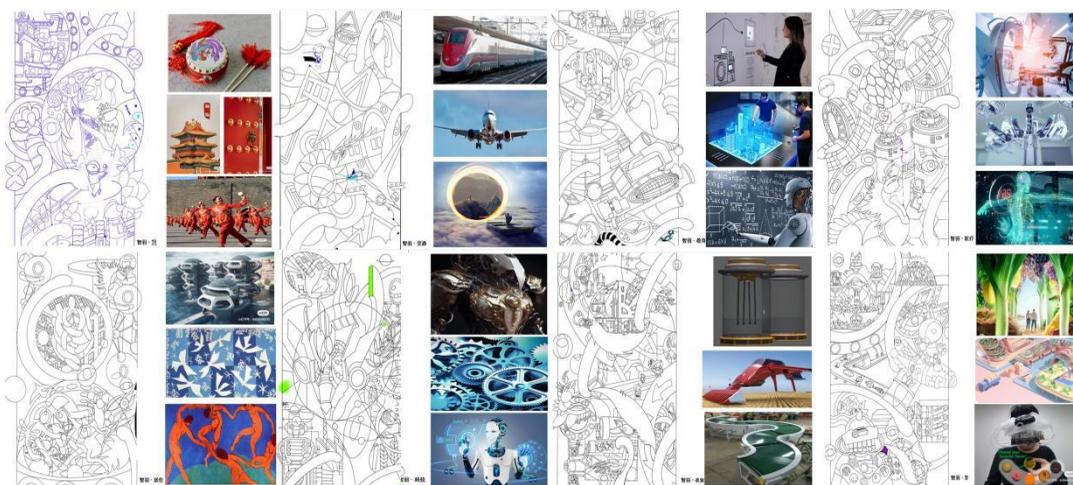


Figure 50. future scene element color extraction

4.2.2.6.4. Digital organization

The focus of this digital compilation is to summarize the elements and future life scenes of Anhui Phoenix Paintings in Anhui Province, so as to finally present a series of illustrations composed of these elements. During the sorting process, these scenes were divided into eight categories, including planting, food, traditional culture, medical care, education, transportation, technology, residence, etc., and finally combined with the elements of Anhui phoenix painting in Anhui Province, they were organized into eight illustrations to represent Anhui Province. Anhui phoenix painting art is combined with future scenes, making it a part of future life, creating new art forms and lifestyles, and promoting the inheritance and development of phoenix painting art in the modern era. The eight illustrations simplify and summarize the extracted elements into simple graphics to give them a sense of composition. By cutting and structuring the pictures, many unique phoenix painting elements or life scene modules can be obtained, which can be combined into new art pattern. Moreover, the eight illustrations also have a unified pattern. The unified vertical composition makes the illustrations formatted and dynamic, paving the way for subsequent information interaction design. The composition pattern of the entire

digital arrangement is to decent rally organize the elements of phoenix paintings and future life scenes. Cut and split each element into different parts, classify and summarize each individual part, and construct a series of illustrations based on the combination of different individual parts.



Figure 51. Zhiyu series illustration display

4.2.2.6.5. Digital presentation

The main task of digital presentation is to establish a connection between digital data and users to provide a better digital experience. Digital information interaction design can be presented in a variety of ways, such as interactive devices, digital short films, digital exhibitions, etc. The design work is finally presented through 3D modeling. At the same time, 3D modeling can also be combined with modern technological means, such as VR, AR, etc., to present digital phoenix painting art works in front of people. Displaying the works using interactive equipment is another aspect of digital information interaction design. a method. Put the works into

the exhibition hall and use your mobile phone to scan the QR code to achieve AR interaction, allowing the audience to better interact with the works, reflecting the modern feasibility of phoenix paintings. Presenting 3D modeling through interactive devices such as mobile phone screens and touch screens can create a sense of interaction between the viewer and the phoenix painting artwork and enhance the experience. Audiences can interact with digital information through simple interaction methods such as gestures and voice to obtain more information content. In addition, the exhibition hall is equipped with VR displays, interactive photos and other forms to allow the audience to better experience the charm of Anhui phoenix painting art in Anhui. Through digital short films and virtual reality, people can immersively appreciate the details of Anhui Phoenix art works in Anhui Province, enriching the visual experience, and future life scenes will also make viewers feel more immersed in the scene.

Digital exhibitions can display phoenix paintings to more people and enrich people's visual experience. The digital exhibition combines the works with mobile applications, Web display and other methods, so that more people can appreciate the phoenix painting art works anytime and anywhere. Through the application of digital technology, the digital exhibition imagines the combination of phoenix painting art works and future life, and brings viewers into it to provide rich explanations and displays of the possible development of phoenix painting artistic style in the future. Audiences can better understand the cultural connotation and artistic charm of phoenix painting art through multimedia interaction and other methods.



Figure 52. Work interactive scene

4.2.2.7 Shape of Phoenix: Digital innovation design and practice of brand image based on graphic language



Figure 53. Pictures of works "Shape of Phoenix"

Through the subject analysis in Chapter 1 and the research analysis in Chapter 2, this topic found that brand image design is currently developing very rapidly and the methods have become more diversified. The intervention of graphical language in brand image design and the application of digital design have made Brand image design breaks the original development boundaries and becomes a better way to promote cultural communication and development. I understand that the current domestic emphasis on the development of traditional culture has also seen the integration of traditional culture into brand design, which has greatly promoted the development of traditional culture. Therefore, brand image design has a significant role in the spread of culture. Therefore, this project will combine graphic language as a method, brand image as a carrier, and integrated digital innovation design into brand image design, and conduct a digital innovation design and practice of brand image based on graphic language.

4.2.2.7.1. Design analysis

Through the investigation of intangible cultural heritage, it was found that the innovation ability of promoting and promoting some traditional cultures is relatively weak, the level of activation needs to be improved, the scope of dissemination is not wide enough, and the method is not novel enough, so this project selected Anhui Phoenix Painting in Anhui Province as the creation Content, use the brand image digital design path to present and promote Anhui Phoenix Painting, and promote the spread and development of Anhui Phoenix Painting. Therefore, this creation is a digital innovative design and practice of brand image based on graphic language using Anhui Phoenix.

Collect information and pictures related to intangible cultural heritage design, determine the drawing style through analysis, and find relevant cases. Understand the expression forms of digital brands and the popular design styles in today's society, and extract the main traditional elements and combine them with the

original culture to design, with bright colors and unique characters that are more trendy. As shown in the picture (54) Yutan Clay Sculpture Cultural and Creative Design, Intangible Cultural Heritage Art Workshop Cultural and Creative Design.



Figure 54. Work case reference

The process plan of this project design based on the above cases is as follows:

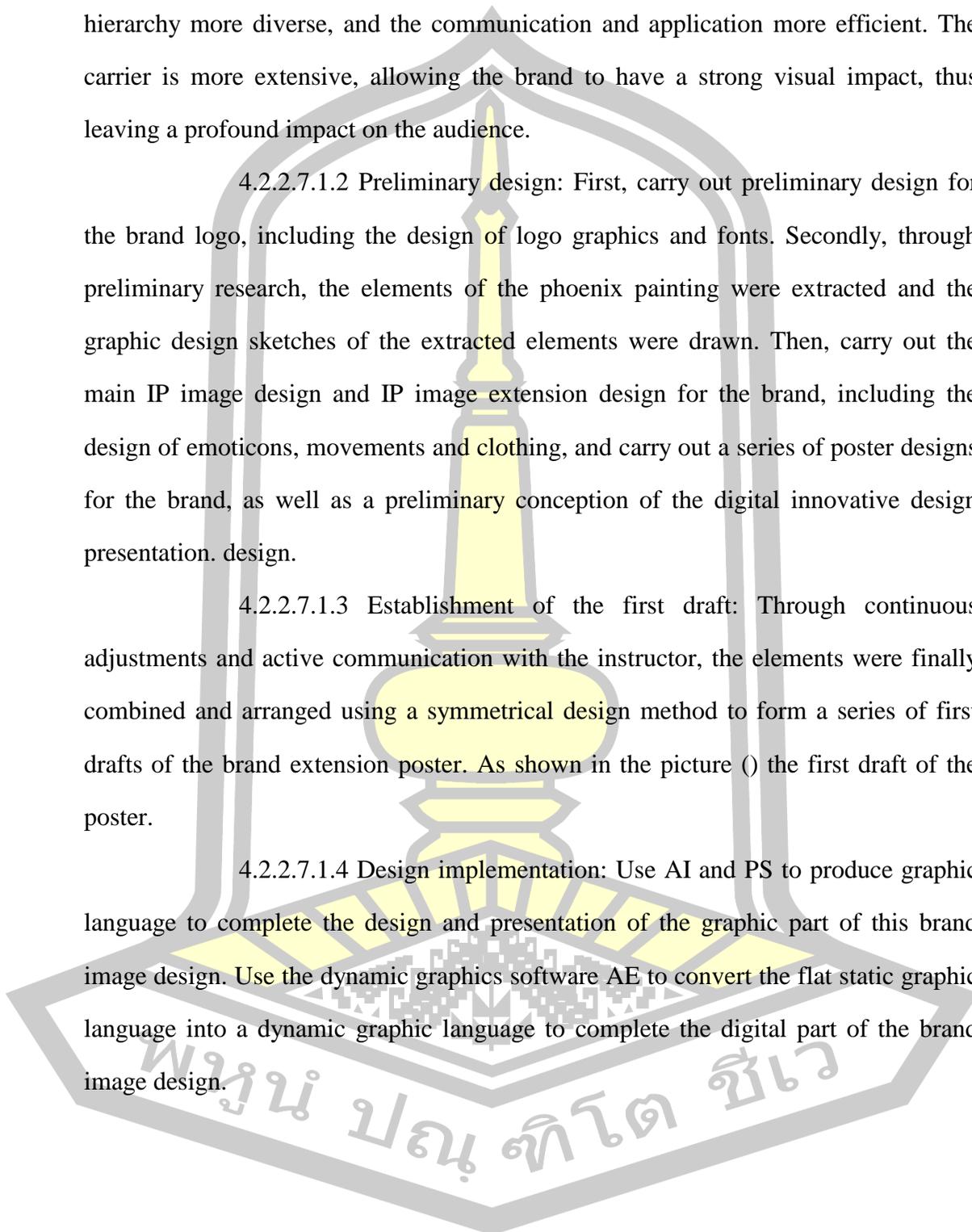
4.2.2.7.1.1 Design positioning: Based on the preliminary research, establish the direction of the brand image. Create a digital Anhui Phoenix brand image based on graphic language. It is planned to integrate graphical language into the brand design, and apply rich colors and auxiliary graphic design to the design of

the brand's visual image, making the brand's visual symbols more concise, the visual hierarchy more diverse, and the communication and application more efficient. The carrier is more extensive, allowing the brand to have a strong visual impact, thus leaving a profound impact on the audience.

4.2.2.7.1.2 Preliminary design: First, carry out preliminary design for the brand logo, including the design of logo graphics and fonts. Secondly, through preliminary research, the elements of the phoenix painting were extracted and the graphic design sketches of the extracted elements were drawn. Then, carry out the main IP image design and IP image extension design for the brand, including the design of emoticons, movements and clothing, and carry out a series of poster designs for the brand, as well as a preliminary conception of the digital innovative design presentation. design.

4.2.2.7.1.3 Establishment of the first draft: Through continuous adjustments and active communication with the instructor, the elements were finally combined and arranged using a symmetrical design method to form a series of first drafts of the brand extension poster. As shown in the picture () the first draft of the poster.

4.2.2.7.1.4 Design implementation: Use AI and PS to produce graphic language to complete the design and presentation of the graphic part of this brand image design. Use the dynamic graphics software AE to convert the flat static graphic language into a dynamic graphic language to complete the digital part of the brand image design.



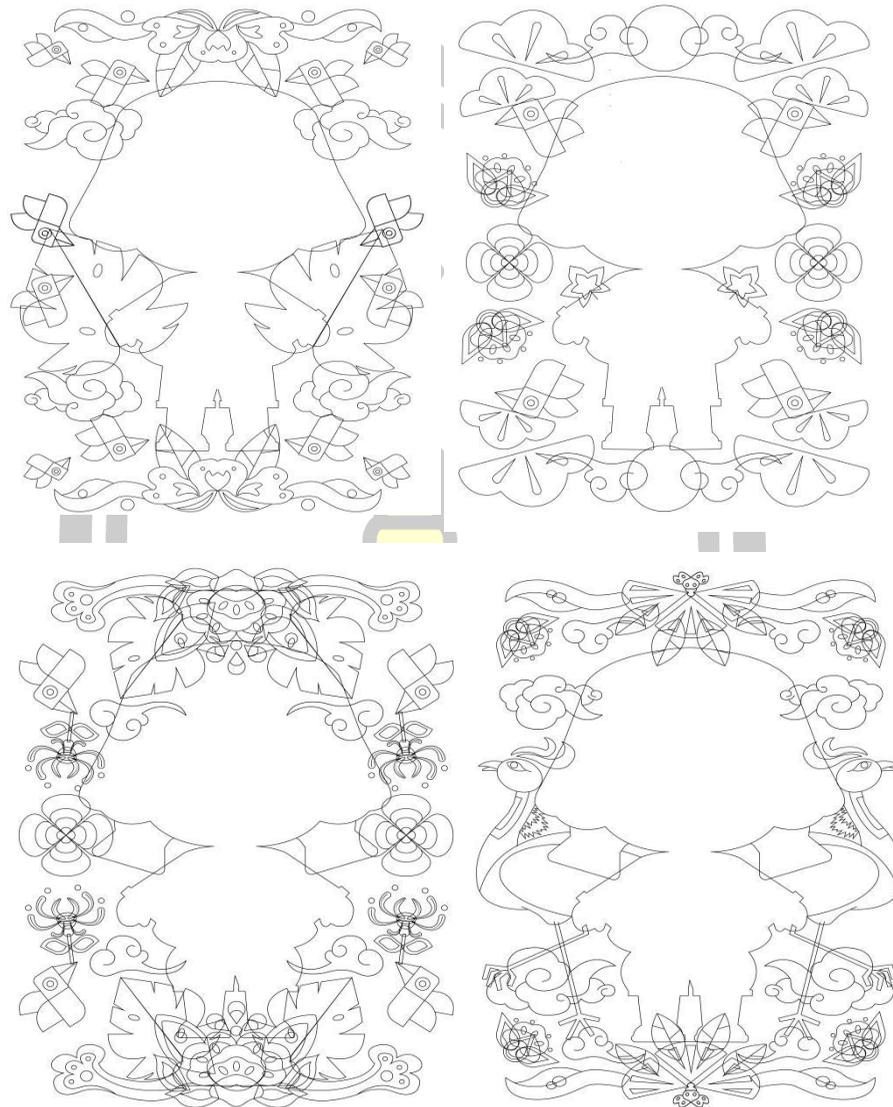


Figure 55. Line drawing of the core elements of the work

4.2.2.7.2. Digital collection In-depth understanding of Anhui Phoenix Painting and collection of pictures will provide premise and basis for the continued development of follow-up work. The collection and integration of pictures of Anhui phoenix paintings requires a lot of searching and finding relevant documents. Through continuous searching and integration, it is concluded that the main themes of phoenix paintings are mainly phoenixes, and most of the phoenix shapes are relatively similar.

Unified, after sorting out the elements in phoenix paintings, we found that phoenix paintings also contain very rich elements, such as flying birds, phoenix trees, auspicious clouds, waves and other elements. As shown in the figure (56)



Figure 56. Extraction of Phoenix, the core element of the work

4.2.2.7.3 Digital organization

This article investigates and analyzes Anhui phoenix paintings, and believes that Anhui phoenix paintings are mainly a combination of phoenix as the main body and different scenes. Among them, the pictures of phoenix paintings mostly include birds, pine, sycamore, peony, magpie, auspicious clouds, etc. with Chinese characteristics. The traditional auspicious patterns are all beautiful things. Therefore, phoenix paintings also became a carrier of people's expectations for auspiciousness, happiness and a better life at that time. By extracting the elements and digitally collecting and sorting the colors. As shown in the figure (57) digital collection and arrangement.

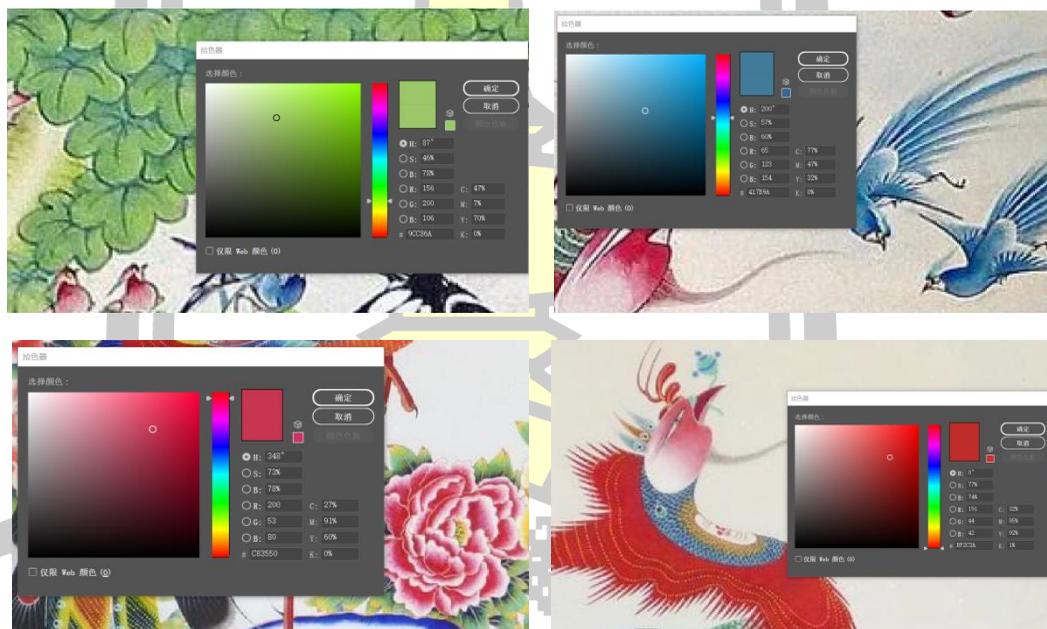


Figure 57. Color value of the work

4.2.2.7.4. Digital processing

By extracting the elements from the phoenix paintings and using drawing software such as PS and AI to graphically process and design them, the pine trees,

phoenixes, rising sun and other elements in the phoenix paintings were extracted to form a graphical design language. A data-based collection breaks the traditional painting model of phoenix paintings and forms a series of trendy phoenix painting expressions to promote the spread of phoenix paintings. Digital processing of elements as shown in Figure(58).



Figure 58. Organizing auxiliary elements of works

4.2.2.7.5. Digital presentation

Based on the extraction of the basic graphics of Anhui Phoenix Painting, with the purpose of promoting the development of Anhui Phoenix Painting, we carry out innovative design and establishment of the digital image of Anhui Phoenix Painting. The main content is shown in the digital presentation in Figure 3-11. The representative artistic elements in phoenix paintings are digitally processed to form unique visual elements. They are combined and arranged by symmetry, repetition and other methods to form a unique visual system, and a series of posters are produced for

display. Then, establish a visual IP image for Anhui Phoenix, extend it, and make physical signboards to increase its recognition; finally, display and interactively experience the digital innovative image. In the process of designing graphic language and brand visual image, the design theory and method were changed, and a digital image rich in personality, spiritual connotation and cultural value was constructed, so that the graphic language of Anhui Phoenix can be richly expressed and extend.



Figure 59. Original color display of works

4.2.2.8 Luanxiang·Fengji: Innovative design and research of digital picture books in the new era



Figure 60. Pictures of works “Luanxiang·Fengji”

The research and exploration of this topic "Innovative Design and Research of Digital Picture Books in the New Era" is the main content. Integrating the expression

of the spirit of the new era and the cultural spirit of phoenix paintings into the digital picture books, so that the audience can feel the infection of the spirit of the times and spread the new era to the greatest extent. Spirituality and traditional culture of phoenix painting. By using the spirit of youth and the cultural spirit of phoenix paintings as the carrier, digital picture book design presentation methods are used to express the unique charm of youth in the new era. The significance of this topic "Research on Innovative Design Language of Digital Picture Books in the New Era" is to establish a new expression method of traditional culture and digital technology in the new era, establish an innovative integration paradigm of the spirit of the times and traditional culture, and spread the new era through digital picture books. The mission and responsibility requirements of the youth.

4.2.2.8.1 Design research

This topic "Innovative Design and Practice of Digital Picture Books in the New Era" starts from the concept and characteristics of digital picture books, analyzes the development status and development trends of digital picture books, and analyzes innovative design methods of digital picture books from aspects such as picture book creation and interactive interfaces. And conducted practical exploration based on specific cases. Since the new era, our country's national cultural confidence has been growing day by day, so our country's cultural-related industries have also ushered in a period of growth. Digital picture books are a very important content section. Since the launch of New Era in 2017, New Era has been rushing to develop the digital picture book industry, with a large number of projects and companies emerging one after another. With the advent of the 5G era, my country's digital industry has entered a new period of development. Digital picture books have also become a new business format, and digital picture book publishing has emerged as the times require. Digital picture books are new reading products with picture books as the core content. They are an important carrier to meet the reading needs of the masses and promote their

growth in the mobile Internet era. Therefore, this topic has certain research significance.

By grasping the spirit of the new era and understanding and investigating traditional Chinese culture, this project will use Chuzhou Anhui Phoenix Painting as a starting point and depict the daily conditions of Phoenix Town to show how the spirit of the new era is reflected in people. In all aspects of daily life, the spirit of the times is based on the present and combined with traditional folk art, which is the perfect combination of tradition and modernity. The specific research contents are as follows:

4.2.2.8.1.1 From the perspective of traditional culture, explore the innovative expression of Anhui phoenix paintings in digital picture books in the new era. Explore the application and expression of graphic language in the dissemination process of the New Era Youth Spirit and Phoenix Culture Spirit, and how to give full play to the emotional and interesting advantages to make the New Era Youth Spirit be disseminated to the public in a short time.

4.2.2.8.1.2 Use the design method of digital picture books as a path to investigate and spread the effective integration of traditional culture and digital technology in the new era.

4.2.2.8.1.3 Taking the spirit of youth and the cultural spirit of phoenix paintings as carriers, explore how to use digital picture book design presentation methods to express the unique charm of youth in the new era.

4.2.2.8.2 Digital collection

As shown in the picture () Liu Yixuan's woodcut prints and tea language prints, in the context of the new era, traditional Anhui Phoenix paintings should be innovatively designed by combining digital technology, digital technology and network media. While inheriting the culture of Phoenix paintings, At the same time, it gives it a new era significance. Digital picture books can adapt to modern aesthetics and user needs. In the context of the digital age, not only can traditional culture be

displayed in front of the public, but it can also enhance cultural communication, broaden the scope of cultural communication, and innovate traditional cultural communication methods.



Figure 61. Liu Yixuan's woodcut prints and tea language prints

Through the collation and analysis of traditional Anhui phoenix paintings, the phoenix is personified and a fictional Phoenix town is created to show people's vision of a better life in the new era. The characters of Phoenix Town are designed by extracting the elements of Anhui phoenix painting, such as "snake head, turtle back, nine tails and eighteen wings, eagle's beak, chicken feet, wishful crown" and other phoenix elements. The bright red and green colors of the phoenix painting carry the unique beauty of traditional colors. The phoenix feathers are also one of its characteristics. On this basis, the Phoenix Town is created, which is reflected in all aspects of the daily life of the people in the town. The hard-working, brave and civilized qualities of the people also reflect the residents of Phoenix Town practicing the core socialist values. In this way, the research content of this topic is displayed digitally.

4.2.2.8.3. Digital processing

This project uses the fictional Phoenix Town as the basis to digitally analyze Anhui Phoenix, and uses digital processing technology to extract key elements in the Phoenix paintings, and replace the picture elements with the elements shown in the figure (), the texture expression elements of the prints, and the visual language elements of the prints.



Figure 62. print texture expression element

4.2.2.8.4 Digital organization

4.2.2.8.4.1 Innovative expression of traditional art by symbolizing, personifying, and flattening the elements of phoenix paintings.

4.2.2.8.4.2 Extract the traditional representative colors of phoenix paintings as the background of the picture. The picture is mainly black and white style, supplemented by traditional colors.

4.2.2.8.4.3 Collect, transform and convey the collected phoenix painting information in a unified manner to create innovative works belonging to your own artistic language system.

4.2.2.8.5. Digital presentation

As shown in the e-book (63), the digital presentation of this topic uses modern digital technology to informatize the picture book, use digital pictures and audio to present the final picture, and carry out a series of extensions. In terms of digital presentation, Procreate is used to draw the picture, and software such as Ai and PS is used to adjust and layout the picture. Presenting picture books digitally can greatly increase the frequency of people's reading and viewing, which is more convenient than paper books. Based on this, e-books are produced through some software to complete the digital presentation of picture books. A QR code is also produced on the exhibition board for scanning, and digital products such as mobile phones, computers, tablets, etc. are used to finally present the pictures of the picture books to achieve the digital presentation effect of the digital picture books.

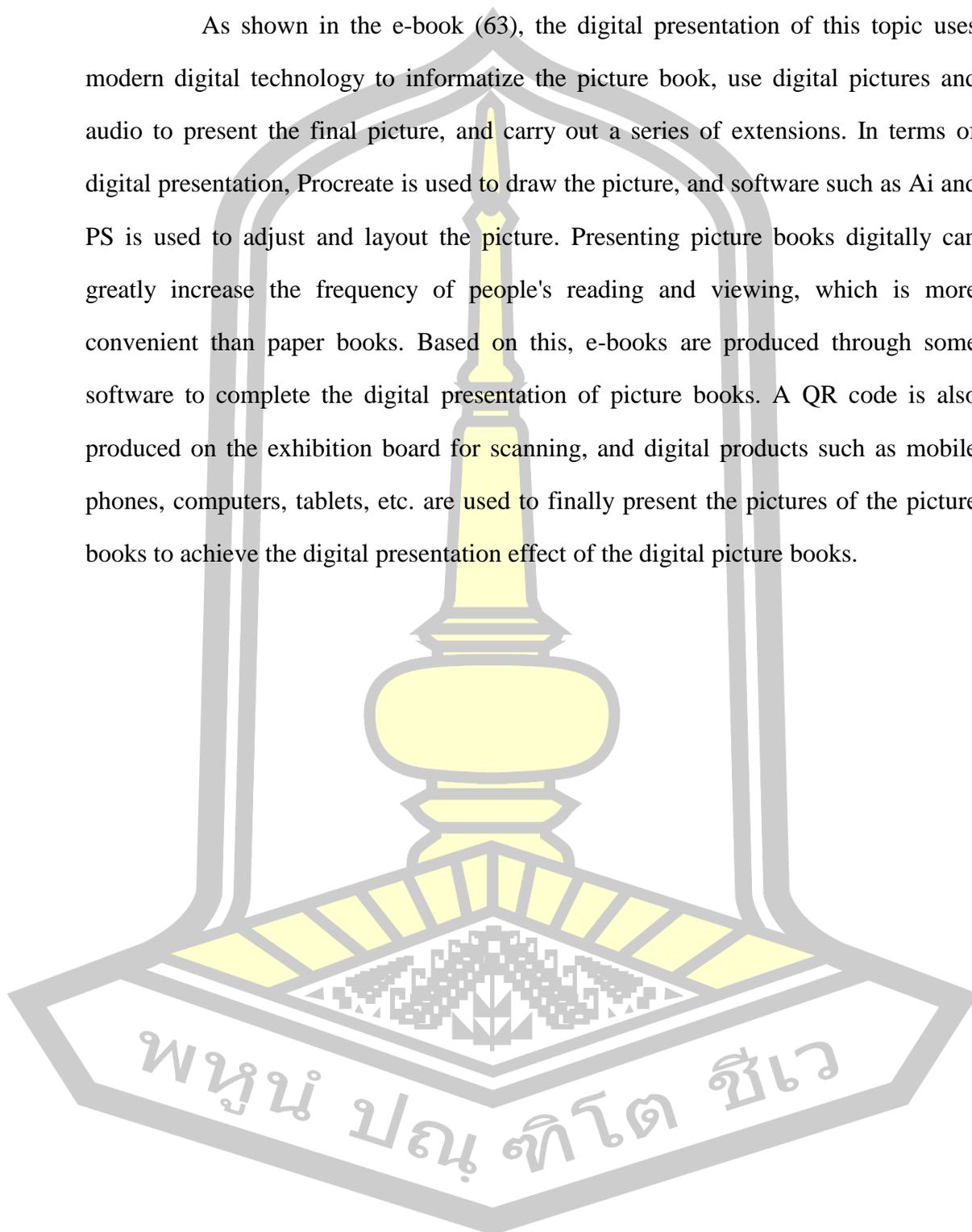




Figure 63. First draft of work

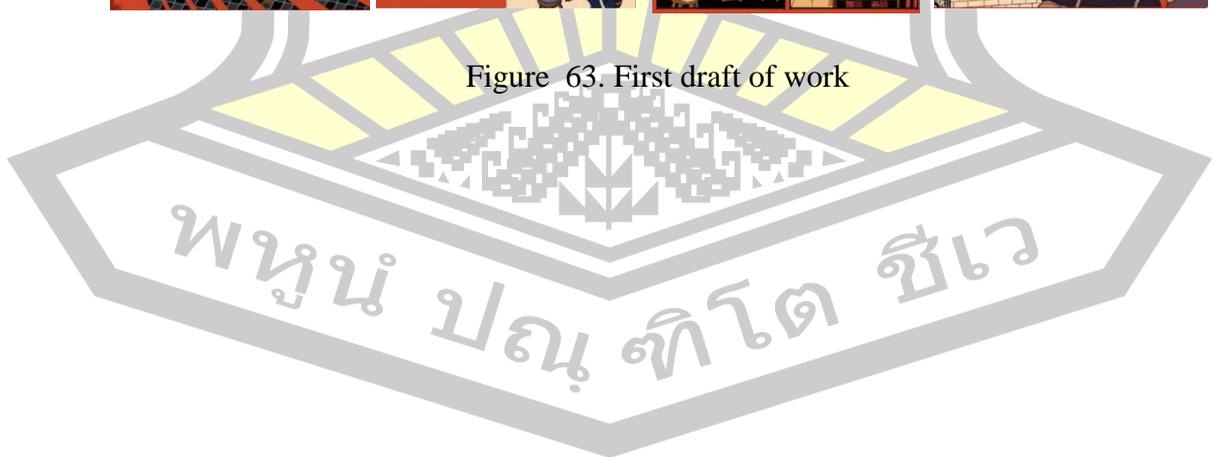




Figure 64. Interactive effects of works

4.2.2.9 Ya·Song: Innovative design and application of digital characters based on intentional narrative



Figure 65. Pictures of works “Ya·Song”

Modern intangible cultural heritage is gradually being protected, but traditional protection methods still do not attract people's attention. People are beginning to realize the importance of new protection methods and the development of these artistic values. Anhui Phoenix Painting is an intangible cultural heritage in Anhui Province. It is one of the cultural heritages and one of the outstanding representatives of local folk art, but its inheritance is insufficient. Facing an uncontrollable dilemma, this project starts from the paintings and stories related to Anhui style painting. It maintains the artistic value of Anhui style painting itself and also carries out digital innovation to effectively protect and develop Anhui style painting.

4.2.2.9.1 Design research

Anhui phoenix paintings have two regulations: "Four Screens" and "Five Phoenix Tower". "Four Screens" shows the different postures of the four phoenixes in spring, summer, autumn and winter, which are "flying and lodging", while "Five Phoenixes" "Lou" shows five harmonious ethical relationships, namely brothers, husband and wife, monarch and minister, father and son, and friends. This topic focuses on digital design methods and combines the beautiful meaning of the Phoenix with style paintings to design digital characters.

4.2.2.9.1.1 Design reference

With the development of the times, many intangible cultural heritage are gradually being forgotten by people. The subsequent problem that needs to be solved is how to correctly and effectively protect Chinese traditional culture. "Wanhua Mirror" and "Glory of Kings" rely on their digital character designs to appear in the public eye as highly innovative works with novel forms and themes. time, it will truly arouse everyone's interest in traditional culture.

In a sense, the Wanhua Mirror is the same as the "Kaleidoscope". Using animation as a hole, the images continue to flow as the video progresses,

showing the clothing characteristics and life moments of fifty-six ethnic groups. As shown in Figure 3-1, "hua " and "hua" have the same pronunciation. Using "hua " instead of "hua" will make people think of China at first. "Fifty-six nations, fifty-six flowers, fifty-six brothers and sisters are one family." China is composed of fifty-six ethnic groups and fifty-six flowers. Each ethnic group has its own characteristics, but it is harmonious and unified. It is a united collective.

The colors of the picture are bright and interesting, which not only embodies the charm of traditional culture but also visually displays the digital character design. Such cultural works can not only stand out and catch people's attention, but also show the confidence of national culture, tell folk stories and reveal emotions. Express. It is cultural, interesting and ornamental.



Figure 66. Character Drawing in "Wanhua Mirror"

Many characters and heroes in the game have traces to follow, as shown in the figure (), giving players a sense of intimacy and identification. Among them, the attributes and skills of each heroic character complement each other with the life stories of the historical figures themselves. For example, the romantic poet and swordsman Li Bai, who drinks and sings with ease and ease; the heroine Hua Mulan, who is chivalrous and tender, and heroic; the imperial concubine and fairy Yang Yuhuan, the pipa dancer, is as graceful as a giant with a charming smile. These

rich and gorgeous characters are equivalent to re-innovating historical images into people's vision, adding a touch of interest.

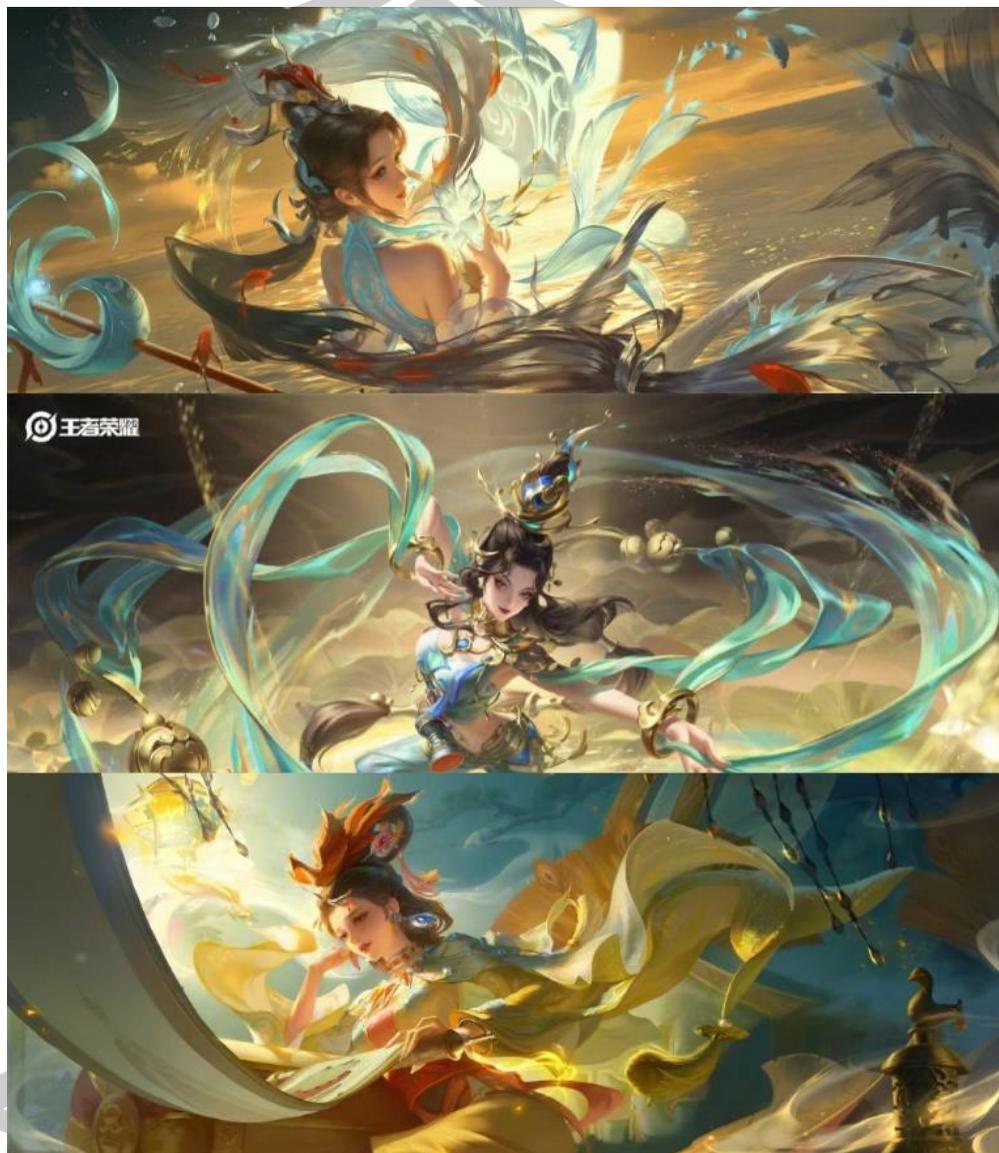


Figure 67. "King of Glory" character image drawing

4.2.2.9.2 Digital collection

This project selects Anhui style painting as the main theme for innovative digital character design, and combines the images of nine phoenixes for re-innovation.

They are blue phoenix, peacock, fire phoenix, snow phoenix, golden phoenix, gale, thunderbird, colorful phoenix, and big phoenix. Peng. Among them, the blue phoenix, peacock, fire phoenix and snow phoenix show the rules of the phoenix painting "Four Screens". The characters in the painting represent the "spring, summer, autumn and winter" in the phoenix painting, and the corresponding expressions are "flying and sleeping". The golden phoenix, gale, thunderbird, colorful phoenix, and Dapeng display phoenix paintings, and the regulations of "Five Phoenix Tower" express five harmonious ethical relationships, namely brothers, husband and wife, monarch and minister, father and son, and friends. Use digital characters as an important element of visual expression to achieve rich picture effects and visual art transmission. The specific collection process is as follows:

First, Use AI to organize and list the phoenix paintings with graphic elements; scouse procreates to integrate phoenix painting elements into digital characters; last Use PS to extract the color of phoenix painting, combine digital character image design with phoenix painting art, and finally present the inheritance and development of phoenix painting art through innovative image design.

4.2.2.9.3. Digital processing

This project uses PS and ai as image processing software to extract elements related to phoenix paintings. Using PS and ai can enlarge the canvas without compromising accuracy, which is suitable for extracting Anhui phoenix painting patterns. In terms of working software, according to the needs of the digital protection and development of Anhui Phoenix paintings, procreate was selected as the image digital processing software. Use Sai as character graphics drawing software.

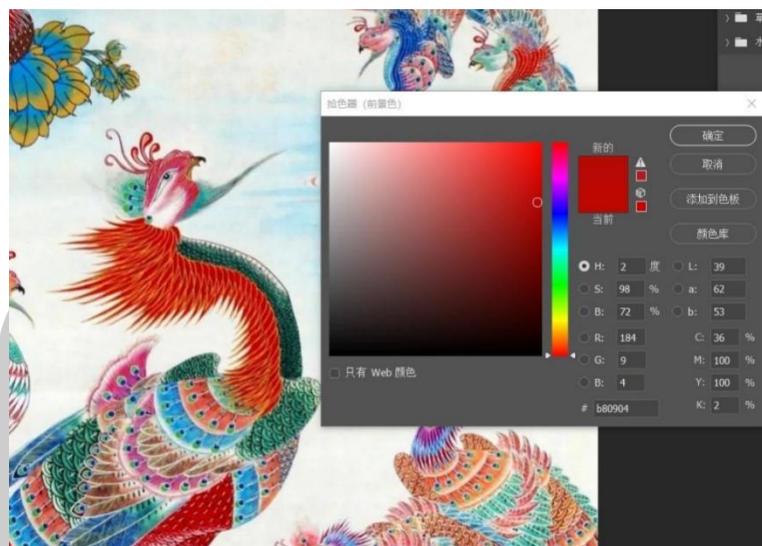


Figure 68. color value extraction

4.2.2.9.4. Digital organization

Anhui Phoenix Map has been in a state of hesitation and uncertainty for a long time since its development. The creative area is relatively scattered, so we choose to quantify the colors used, and try our best to convert traditional artistic colors into accurate RGB values to create a phoenix painting color card. In the process of designing characters, the character's shape, appearance, clothing, color and other aspects need to be carefully considered, as shown in the figure (), in order to create a visual expression that fits the theme, enhance the cultural communication power of the work, and better convey the correct meaning, oriented philosophy and values. Therefore, for design, the application method of digital character design is not limited to this. It should not only convey visual beauty, but also express emotional and intentional narratives. Thus, reaching a deep emotional resonance.

4.2.2.9.5. Digital presentation

This project aims at the digital collection of phoenix painting art graphics, and basically determines the basic Anhui Phoenix painting resource database of digital characters as the resource database of Anhui Phoenix painting. The author used

clothing patterns combined with style paintings. After the painting was completed, he applied this work to scrolls, Kunming lanterns and other objects with auspicious meanings of blessing and auspiciousness, which has a strong visual impact and artistic effect. At the same time, during the digital organization process, the digitally presented character images will be applied to IPADs, mobile phones, and computers in the form of AR visual effects, dynamic videos, etc. Use nomad software to model the picture scroll for the picture effect, and apply it to the AR real-life effect to achieve an interactive experience with the real environment. In terms of digital presentation, it improves communication with users and enhances cultural communication.



Figure 69. Plan drawing of Jiufeng image

Digital plane effect presentation: Use electronic software to draw and display the plane effect, as shown in Figure (). Digital character presentation: When this topic "Innovative design and application of digital characters based on intentional narrative" is applied to mobile phones, it interacts with users through videos, AR photos, etc., as shown in the picture using mobile devices, iPad, mobile phones, and

notebooks etc., as shown in Figure (), scan the customized QR code, and use the designated software to present the final innovative work.



Figure 70. The interface display of the Nine Phoenix image drawn as a picture on the mobile phone

4.2.2.9.6 Achievements

First Prize in the Anhui Province Division of the 11th Future Division National College Digital Art Design Competition

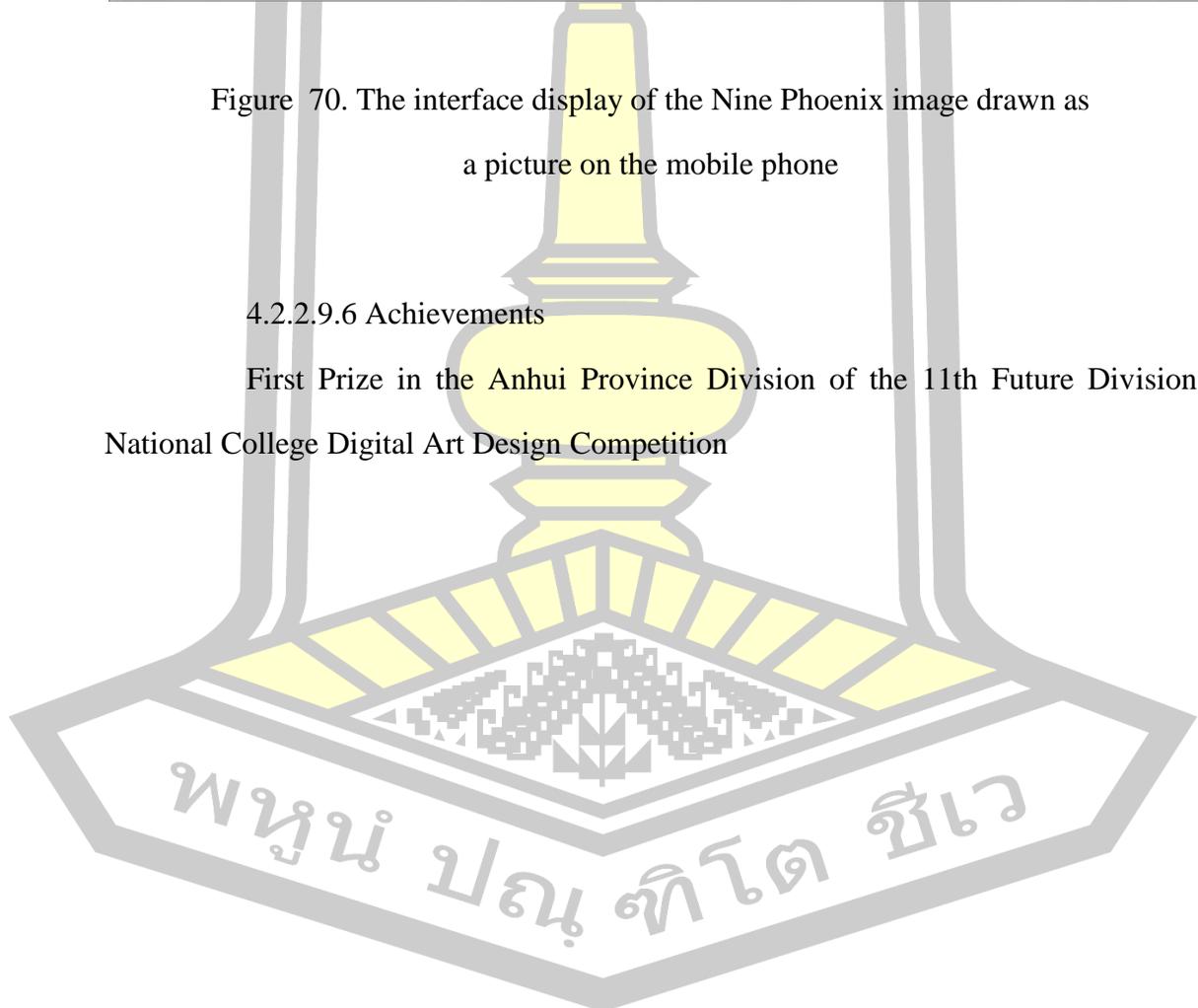




Figure 71. Work award certificate

4.2.2.10 Luanxiangyou: Innovative design and practice of virtual experience in the digital era



Figure 72. Pictures of works “Luanxiang·Fengji”

This topic starts from the perspective of virtual experience design and will focus on the theory of virtual experience design in the context of Anhui Phoenix culture for artistic creation design. Therefore, the content of this chapter is based on the design of virtual experience with Anhui Phoenix Painting as the background, explores the construction characteristics of Anhui Phoenix Painting, extracts the original elements of Anhui Phoenix Painting, and digitally utilizes the elements of Anhui Phoenix Painting from a design perspective, and combined with innovative language, summarized and sorted out the elements of virtual experience design and Anhui phoenix painting art design, and designed a set of models suitable for virtual experience with phoenix painting as the creative theme.

4.2.2.10.1 Design research

The main research content of this topic "Innovative Design and Practice of Virtual Experience in the Digital Era" is to apply the traditional artistic elements in Anhui Phoenix Painting in Anhui Province to the innovative design of virtual experience. By consulting the information and pictures of Anhui phoenix paintings, we analyze and study the scenes in the phoenix paintings, analyze and extract the elements of the phoenix paintings, and obtain the visual, auditory and olfactory elements of the phoenix painting scenes, thereby establishing a new virtual experience environment. The design is carried out based on the virtual experience theoretical model and user demand positioning, and visual elements are used to build the virtual scene of Anhui Phoenix. Before starting the design, I reviewed relevant cases. The following is a case sharing based on the direction of virtual experience design:

As shown in the figure (), the VR interactive work "Painting the Spiritual Realm" is based on virtual reality technology (VR) technology. Taking Qiu Ying's "Taoyuan Wonderland" as an example, it explores the digital design of green landscape paintings and attempts to expand the display of relevant cultural content of the paintings. Channel, explore the cultural value inheritance and digital experience of

paintings, and provide new ways for the appreciation, dissemination and re-creation of traditional Chinese paintings.

As shown in the picture (), "Fantasy City of Light" is jointly created by NAKED, INC. Square Enix and other companies with rich experience in the field of new media digital experience, allowing tourists to experience the integration of digital creativity and real scenes, thus bringing unprecedented immersive gaming experience. The "Fantasy City of Light" immersive experiential digital scene tourist attraction combines immersive interactive amusement scenes with seven different worldviews: flowers, ocean, universe, forest, sports, music, forest, etc. Themes such as "Flowers and Light" and natural science are combined with digital technology, using "new media art + light and shadow interaction + digital scenes + immersive experience" to satisfy tourists' curiosity to explore the unknown and give them a unique experience.

As shown in the picture (), Travis Scott's "Fortnite" virtual concert. Travis Scott's virtual concert was nominated by MTV for the Best Metaverse Performance Award at the 2022 Video Music Awards (VMAs). This is MTV's first performance this year new award categories added. Metaverse performances are musical performances performed in the digital space, performed by avatar artists, and with interactive participation from digital audiences. When Travis Scott sings "rain-drops (an angel cried)", in the background of the vast starry sky, the blue beam of light transforms into an avatar similar to the real-life image of Travis Scott. The user wakes up in the dark, reaches out to pull his fallen friends, and the golden stars gather together and rise slowly. In the virtual scene, the players experience a concert experience that is different from the physical but very novel.

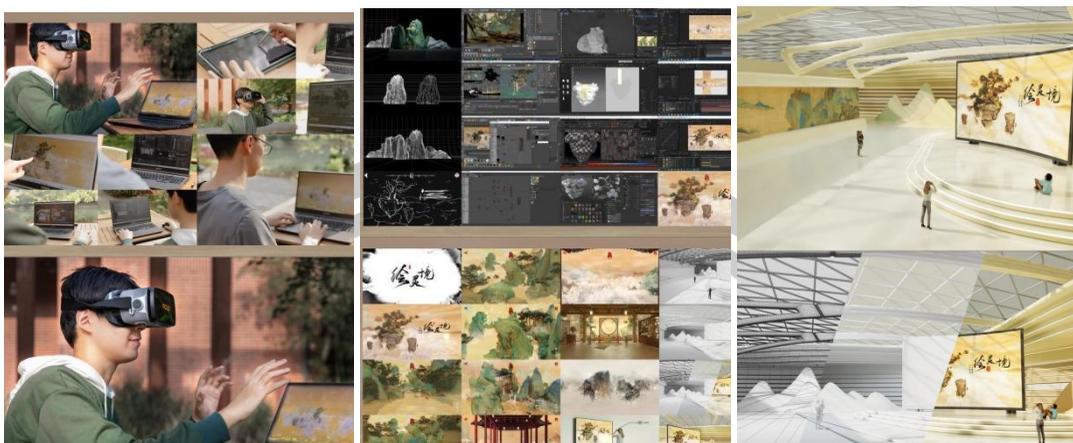


Figure 73. "Huilong Realm" VR interactive display



Figure 74. Travis Scott's "Fortnite" Virtual Concert

4.2.2.10.2 Digital collection

The creation of phoenix paintings has its own unique painting elements and has important graphic value. Next, the content, composition, line characteristics and color characteristics of the theme are analyzed and reconstructed, and its

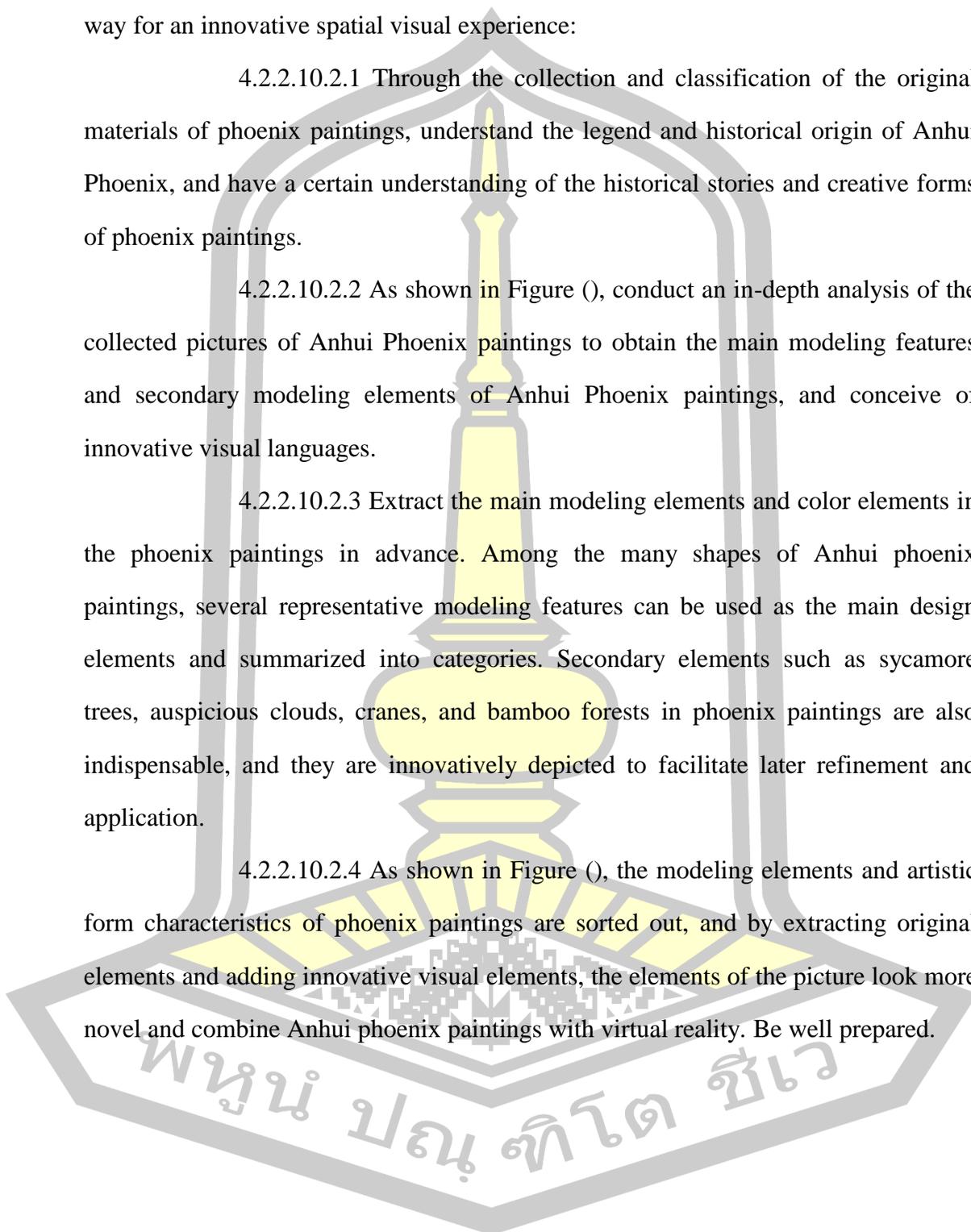
characteristics are expanded and laid out for easy refining and application, paving the way for an innovative spatial visual experience:

4.2.2.10.2.1 Through the collection and classification of the original materials of phoenix paintings, understand the legend and historical origin of Anhui Phoenix, and have a certain understanding of the historical stories and creative forms of phoenix paintings.

4.2.2.10.2.2 As shown in Figure (), conduct an in-depth analysis of the collected pictures of Anhui Phoenix paintings to obtain the main modeling features and secondary modeling elements of Anhui Phoenix paintings, and conceive of innovative visual languages.

4.2.2.10.2.3 Extract the main modeling elements and color elements in the phoenix paintings in advance. Among the many shapes of Anhui phoenix paintings, several representative modeling features can be used as the main design elements and summarized into categories. Secondary elements such as sycamore trees, auspicious clouds, cranes, and bamboo forests in phoenix paintings are also indispensable, and they are innovatively depicted to facilitate later refinement and application.

4.2.2.10.2.4 As shown in Figure (), the modeling elements and artistic form characteristics of phoenix paintings are sorted out, and by extracting original elements and adding innovative visual elements, the elements of the picture look more novel and combine Anhui phoenix paintings with virtual reality. Be well prepared.



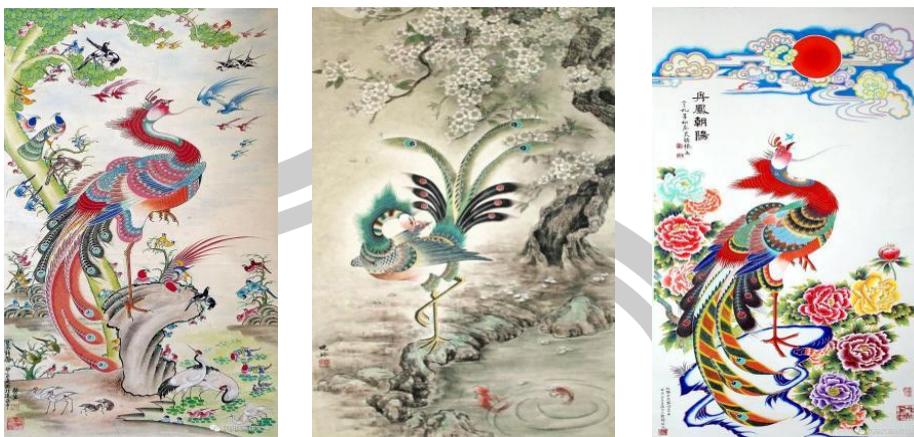


Figure 75. Original material of phoenix painting

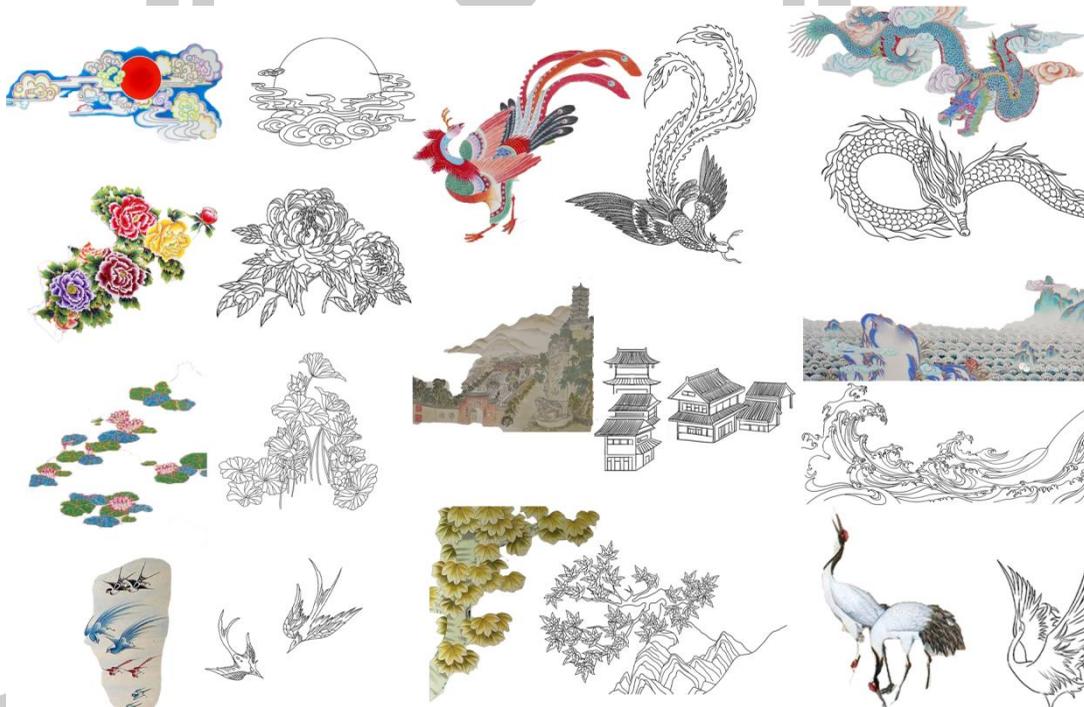


Figure 76. graphic element collection

4.2.2.10.3 Digital processing

As shown in Figure (77), first of all, taking the original content of Anhui Phoenix Painting as the core of the design, the elements should be refined and redesigned based on the cultural value and connotation of Anhui Phoenix Painting,

and careful speculation should be carried out. Starting from the essential content of Anhui Phoenix Painting, based on the shape, color, and meaning of Anhui Phoenix Painting, innovative visual language design is carried out in the design positioning that shows the color, modeling techniques, and diversity of Phoenix Painting.

4.2.2.10.3.1 As far as Anhui phoenix paintings are concerned, the phoenix is the most distinctive. The phoenix pattern symbol is extracted from the phoenix pattern. The phoenix pattern and color are used as virtual experience design elements. Applying them to the virtual experience design can strengthen the virtual experience. Cultural perception in experience design not only conforms to traditional aesthetic habits, but also allows people to have a more intuitive understanding of regional customs.

4.2.2.10.3.2 The Shane buildings in the virtual experience design should be based on the local scenery of Anhui. Some ancient buildings are somewhat affected by time and humanistic factors. In real life, more and more ancient things gradually disappear. By reshaping these historical relics and incorporating elements of the new era, they become a vital symbol to express thoughts and emotions, allowing the virtual experience design to reproduce the local customs and architecture of Anhui, which not only has local characteristics, but also can Deepen people's cultural impression.

4.2.2.10.3.3 Import all the extracted information elements of the phoenix painting into the newly created Photoshop canvas, combine the traditional elements in the phoenix painting with the innovative visual language through research and analysis, and draw sketches to achieve combination and reconstruction of different elements. and innovative portfolios.

4.2.2.10.3.4 Through the analysis of the color of the phoenix painting image, this article summarizes the color palette of Anhui phoenix painting. Through

the selection and adjustment of the color palette, it is finally decided to use yellow and green as the main color, supplemented by brown, cool and light colors, etc. color.

4.2.2.10.3.5 Anhui Phoenix Painting has strong oriental elements, so it combines modern aesthetic techniques with Western aesthetic concepts. It is based on the original picture shape and incorporates several new features into the artistic design. At the same time, it does not change the oriental elements and Chinese Artistic creation based on traditional aesthetic factors.



Figure 77. design sketch

4.2.2.10.4 Digital organization

Through the above arrangement, we conduct an in-depth analysis of the graphic resources of Anhui Phoenix, fully understand the malleability of traditional resources, and expand visual elements that are not actually completely real scenes in the virtual experience design. To supplement it, through related the design concept

can be replaced and arranged at will without violating the design goals, forming a virtual experience design picture with innovative visual language to highlight the characteristics of Anhui Phoenix Painting.

4.2.2.10.4.1 Incorporate additional creative techniques into the original materials of phoenix paintings, and create a more elegant phoenix shape based on the original phoenix form, and add human figures, etc., to make the content of the picture richer and more approachable.

4.2.2.10.4.2 Colors vary depending on the theme, and the matching methods are also different. After analyzing and comparing the original picture elements, deletions and additions are made after fully considering the completeness, contrast, layering, virtuality and reality of the color of the picture, and using Use the color wheel in Photoshop to adjust colors.

4.2.2.10.4.3 For some special circumstances, the scene and background colors can be kept the same or similar to the original work. It will not only make the picture more complete, but also enhance the visual effect, and then adjust the balance to make the color matching of the entire picture Harmony.

4.2.2.10.5 Digital presentation

As shown in the figure (), through the research on virtual experience design in the digital era and the data collection and element processing of Anhui style painting, the two are connected and combined to complete the modeling and color creation of a series of contents to create the final picture effect.

4.2.2.10.5.1 On this basis, the innovative design of virtual experience requires the construction of a real situational situation, and all concepts to be expressed to the audience of Anhui Phoenix must be turned into visual virtual images and virtual scenes.

4.2.2.10.5.2 Focusing on the Anhui Phoenix Painting augmented reality, design from the perspective of human senses and focusing on visual

experience, create a digital immersive cultural experience, and build a virtual experience community.

4.2.2.10.5.3 Conduct digital interpretation, scene experience functional areas, etc. to create an immersive and interactive virtual experience, a spatial information experience using VR/AR as the carrier, or place participants in plot design to create an immersive experience The virtual space provides an emotional environment with rich experiences. However, in the process of constructing the virtual world, it is not just about visual enjoyment, but also a further understanding of traditional culture, which is helpful for the inheritance of traditional culture.



Figure 78. Long scroll main image display and cultural and creative application display

VR exhibition hall user experience scene display: Based on the real landscape and the integration of multi-culture, a digital panoramic tourism environment is built through cloud rendering technology. Users can get a virtual image representing themselves at the opening and enter the space. , control and drag to view any angle within the 360° range through induction touch. At the same time, users can interact and communicate in real time with the phoenix, avatar or other

users in the same space in the scene, and the booths are equipped with thermal, Wind, onomatopoeia and scent devices can respond to the user's movements, stimulating the user's senses and immersing the user in a hyper-realistic phoenix painting virtual environment.

Interactive display of family life scenes: This scene shows the virtual interactive scene experience in life. With a pair of VR glasses, you can access the Phoenix Culture and Tourism Metaverse Space from any location and any terminal device to experience it without downloading. You can start a fantastic flight journey where culture and technology blend on the web page.



Figure 79. Work interactive scene

4.2.2.10.6 Achievements

Second Prize in the Anhui Province Division of the 11th Future Division
National College Digital Art Design Competition



Figure 80. Work award certificate

4.2.3 Summary

The art of phoenix painting in Anhui, Anhui Province shows unique and exquisite skills. Through research, we found that the phoenix paintings in Anhui area have distinctive characteristics in painting techniques, subject matter, content and style. Anhui Feng Hua is famous for its delicate line drawing and skillful use of ink. The works present a mysterious and elegant atmosphere. Secondly, the development of Anhui Phoenix painting art is inseparable from regional resources and cultural inheritance. Anhui is located in the south of Anhui Province and has a long history and unique natural environment, which provides good soil for the rise of Anhui Phoenix Painting. The cultural background of Anhui area and the influence of traditional folk art also make Anhui phoenix painting art embody rich local cultural elements. At the same time, the art of Anhui Phoenix Painting has maintained innovation and vitality in its continuous inheritance. Anhui Phoenix Painting artists are committed to combining traditional Phoenix painting with modern aesthetics, and through innovation in expression methods, subject selection and artistic forms, Anhui Phoenix Painting shines with unique charm. This innovative inheritance method not only continues the traditional characteristics of Anhui Phoenix Painting, but also integrates it into contemporary society. Finally, we believe that the art of Anhui Phoenix Painting has important research value and artistic significance. Studying the techniques, themes and artistic expressions of Anhui Phoenix Painting will help you gain a deeper understanding of the diversity and unique charm of local art in Anhui Province. At the same time, the inheritance and protection of Anhui Phoenix Painting Art as a local cultural heritage not only helps to promote local cultural confidence, but also promotes the development of art education and tourism industries.

4.3 The cultural value of phoenix painting art in Anhui Province based on digital cultural construction constitutes mimicry

4.3.1 The application paradigm of Anhui phoenix painting art in digital innovation design in the new era.

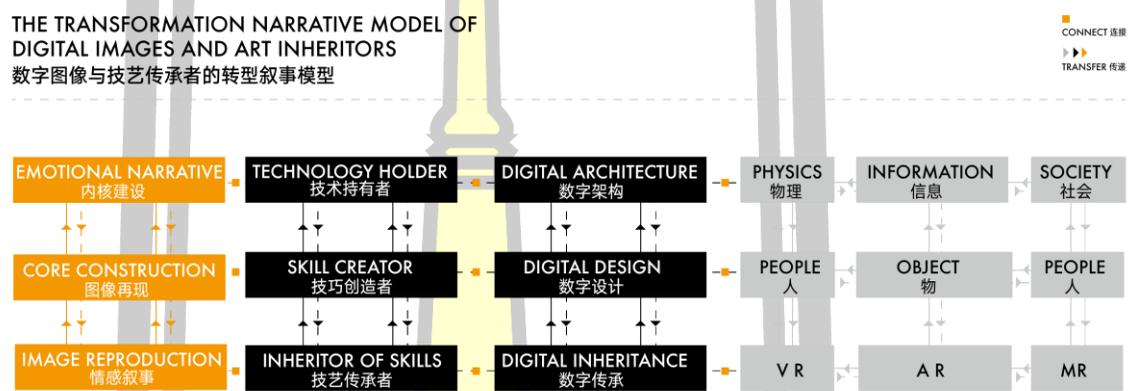
Through the transformation narrative between digital images and skill inheritors, what is described is not an objective real event, but a carefully planned and creative virtual event. To understand the transformation narrative from this dimension, it can be understood as A visual construction of product ontology. The core concept is to use digital images and technical means to realize the process of multiple inheritance, to synchronously interact with the technology inheritors and the event body, and to fully consider user needs and skill updates at the level of skill inheritors and digital images. , innovative expression and other dimensional forms, promote the innovation and dissemination of intangible cultural heritage, realize the diversity and sustainability of digital images, and maximize the intersection and integration with different social forms. A design method that reintegrates in a narrative manner, including redefining the connections and positions between factors, to produce design works.

Regarding the design narrative and method dimensions of digital images of Feng Hua art in Anhui Province, it is not only an objective statement of the ontology of the event, but also a conveyance of subjective consciousness. The relationship is the transformation narrative and integration of user-oriented structured information and "digital architecture-digital design-digital inheritance".

Through the analysis of the digital space model, the author uses digital images as the design object of structure and transformation, combines digital images, symbolic data and other design languages, and uses digital images and technical means to construct the narrative model of the inheritors of skills, so that the inheritance is at the surface level. Events present the inheritance interactive objects of

different modules through the orderly relationship of "digital integration-creative promotion-living inheritance" to achieve the synchronous growth and evolution of event ontology and narrative space, as shown in Figure (10)

Table 12. Transformation narrative model between digital images and skill inheritance



4.3.1.1 Inheritance scenario of digital integration

As the ontology of the event, the skill inheritor, with the support of the digital space model, integrates physical entities and virtual entities and maps them simultaneously to realize the four-in-one digitalization to mirroring of "record preservation-display education-interactive experience-collaborative inheritance" The inheritance process realizes the narrative expression using technology as scene simulation, and reflects the dynamic interaction of digital fusion based on the time, space and performance of the event itself. According to the digital space transformation narrative model, through the simultaneous evolution of the three-dimensional attributes of "physics-information-society", skill inheritors digitally integrate multiple attribute spaces to realize the implicit rules of the event ontology, form a full-plan inheritance situation, and coordinate digital image innovation The design model realizes the integration model of intangible cultural heritage.

4.3.1.2 Situational awareness driven by creativity

For skill inheritors, digital images are the original information for establishing creative deductions, building accurate situational awareness and simulation with creative models, and using preset models to drive established roles and links in the event ontology to deduce different levels of relationships. , comprehensive averaging and optimization of the system status and specific execution status of resources and personnel. In addition, the cyclic relationship of "people-things-people" can be fully considered through the digital space model, the linking behavior of digital images and technology inheritors can be realized with the help of digital innovation technology, and the potential correlation and event ontology of multiple spaces can be analyzed for the previously evolved subjects. Implicit rules realize full-cycle, all-element creative model collaborative deduction and perception.

4.3.1.3 Mimicry formation of living inheritance

Digital images and technical means structure the narrative model of skill inheritors, which can simulate the event ontology and technical performance of living inheritance, provide a panoramic and immersive innovative situation experience from "VR - AR - MR", and realize the inheritance objects of the skill inheritors. It is perceptible and knowable, and Mimicry builds a living inheritance and development model with digital images as the core expression. Through the application of its model's operating mechanism and possible experimental scenarios, it is expected to provide a theoretical basis for the integration of transformation narratives and the scenario, and establish a completely equivalent operating mechanism from the virtual and real space for the dynamic relationship of the event ontology to achieve precision and Multidimensional model empowerment and adaptation of evidence-based data, models and technologies.

Anhui Phoenix Painting has national and regional characteristics in aesthetics. Discovering, feeling, appreciating and creating beauty in working life is the principle

of its creation and its great contribution to human art. Every shape, lines, and colors are all vivid embodiments of traditional folk aesthetic values in different periods. Another characteristic of Anhui phoenix paintings is its deep connection with religion and folk customs, which is an inevitable requirement of folk spiritual life in religious beliefs and folk custom activities. The kind wishes reflected in Anhui Phoenix paintings, the pursuit of a happy life, the exploration of the unknown world, and the worship of mysterious totems all constitute a complete and unique art form and have become the basic characteristics of the national cultural mentality. It represents the most original and typical aesthetic ideal, and is the most basic and valuable resource of human aesthetics.

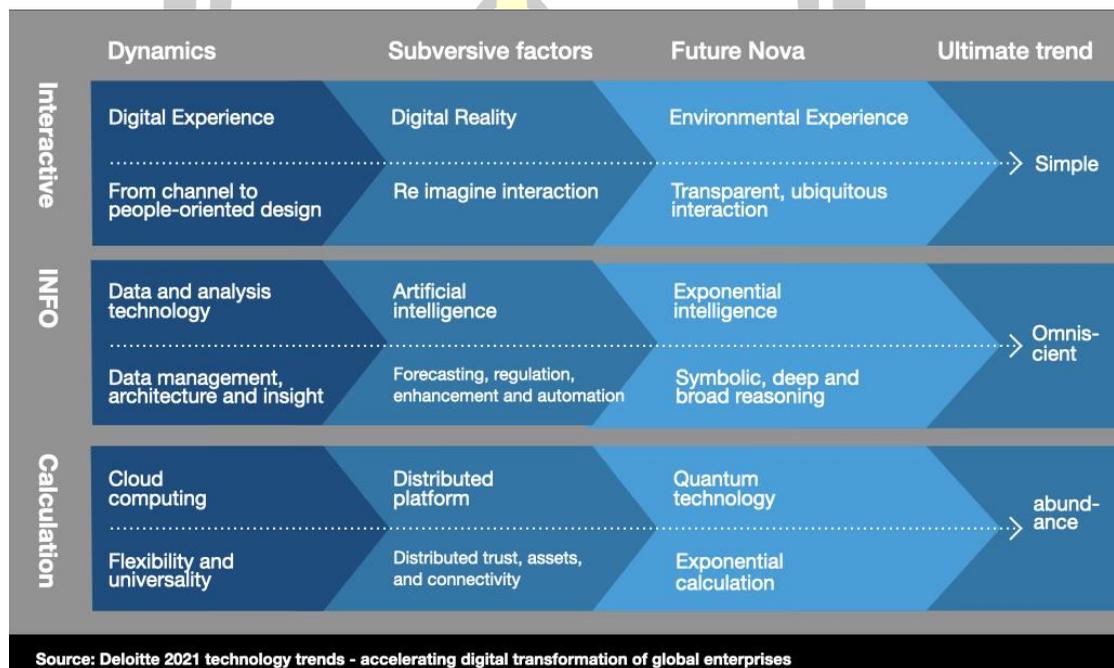
4.3.2 Multidimensionality: "Tradition" is a dynamic category that is sustainable and stable

Re-examining and discovering tradition first means expanding and updating the conceptual category of "tradition" in a timely manner in the process of advancing with the times. Only in this way can the "tradition" we know be timeless and new. Practical and practical. At this level, only by discovering the rich diachronic layers of tradition and fully understanding the aesthetic character and cultural characteristics of traditional Chinese painting in the "big tradition" (ancient tradition) and "little tradition" (modern tradition) can we Truly digest our cultural heritage.

Under the requirements of the new social and cultural context, how to view tradition and recognize the core and extension of the concept of "tradition" has become an important factor in measuring the cultural prescriptiveness of Chinese painting. More and more Chinese painters and cultural scholars from all walks of life realize that although the artistic style of contemporary Chinese painting should be rich and diverse, tradition is an important part of it. At the same time, more painters and theorists have begun to reflect on the role of "tradition". The scope and extension, that is, traditional Chinese painting, as an important representative of Chinese culture and

art, is not only freehand literati painting and its brush and ink tradition, but also includes. Many cultural traditions of the non-literary class also include modern traditions that integrate the wisdom of Chinese and Western cultures since the 20th century. As some scholars pointed out: "Historically, in terms of cultural background and subjective and objective conditions, the inheritance and promotion of literati paintings, especially literati freehand paintings, are only special, while the inheritance and promotion of painters' paintings are universal."(xu,2007)

Table 13. National Digital Transformation Table



Especially in the first twenty years of the new century, when people look back at the achievements and accumulation of Chinese painting in the 20th century, they find that the "tradition" we call today has multi-faceted meanings, including both the modern tradition represented by painters such as Wu Changzhou, Qi Bashir, Huang Banjong, and Pan Tianzhu may be called "little tradition"; it also covers the court tradition represented by the "Four Kings" and "Four Monks" and other painter groups since the Ming and Qing Dynasties. System and literati tradition, Dong Qi Chang's "Northern and Southern Sect" painting style system, in addition to the folk painting

tradition represented by religious art, tomb murals, etc., is also the "great tradition". Between the relatively constant "big tradition" and the revolutionary "little tradition", the tradition of Chinese painting presents dynamic, integrated, continuous and gradual cultural characteristics.

4.3.3 Dynamicity: the possibility and necessity of modern transformation of traditional systems

In the history of thought and academic discourse in the past, many scholars and treatises have discussed the unity of opposites between “tradition” and “modernity” from multiple angles and levels. In the field of Chinese painting, more than a hundred years ago, Chen Sizing introduced the concept of evolution in "The Value of Literati Painting" (1921) to interpret the basis for traditional literati painting to become modern, which can be regarded as a classic case of this topic. How to truly realize the modern transformation of cultural and artistic traditions? Taking Chinese painting as an example, on the one hand, a precise and in-depth understanding of tradition is the premise, and through the collection of painting ideas, painting theory documents, and the historical context of painting, it can be better restored, explore the classicist, accumulation, inheritance and practicality of the Chinese painting tradition; on the other hand, strive to deeply and accurately interpret the essence of the tradition and its future direction, instead of being satisfied with superficial utilization or even "selling" traditional symbols, which is also an important guarantee for promoting the sustainable development of tradition and constructing the traditional spiritual core and value system in the modern context.

As a subject that integrates knowledge and action, and combines historical research and creative practice, the study of the traditional system of Chinese painting cannot be separated from the practice of creation and appreciation, nor from the speculation and research of historical theory, nor from historical literature. The origin of the pulse cannot be divorced from the changes in the new trends of the times.

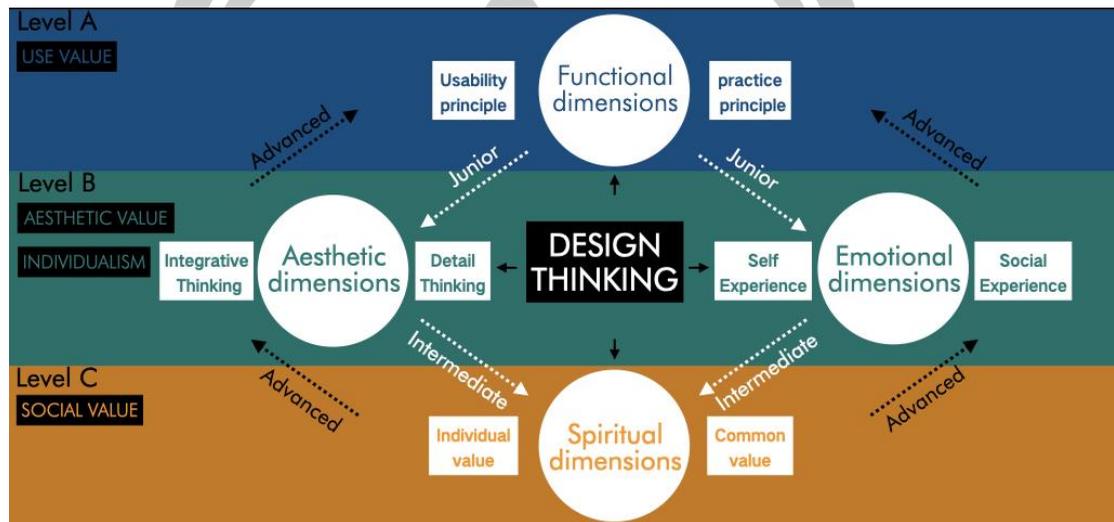
On the one hand, the theory and creation system of Chinese painting itself has a long and self-sufficient academic origin, relatively clear and well-formed research objects, and profound and rich literature results; on the other hand, the theory and creation system of Chinese painting have not yet completed the modernization process in the true sense. Discipline transformation often remains an academic concept that is extremely inclusive, covers a wide range, and is prone to misunderstanding and ambiguity. From the debate surrounding the innovation and improvement of Chinese painting in the early Republic of China, to the discussion on the social function of national art in the early days of the founding of New China, to the debate between China and the West under the influence of Western cultural and artistic trends in the new era, from the "reformation of Chinese painting" in the first half of the 20th century "Theories about "art revolution" and "the value of literati painting", as well as about the "realistic improvement" and "reconciliation of Chinese and Western painting methods", to the intricate debates on the future and destiny of Chinese painting in the modern and contemporary painting circles, whether it is advocating "tradition brings innovation" or "Introducing the west and nourishing the country" has become an important plan for Chinese painting to absorb traditional resources and move towards modernity.

4.3.4 Universality: understanding and constructing traditional systems in the world cultural pattern

Since entering the new era, the cultural context of Anhui phoenix painting art has undergone many changes. How does Chinese cultural tradition present its constructive value of "peace" and "inclusiveness"? How to examine the local cultural identity through reflexive observation and actively and effectively How to properly respond to Chinese painting and even creative issues in the field of painting in the age of images? In this cultural context, thinking about the values of Chinese contemporary art and discussions around the relationship between tradition and innovation have

always continued: What kind of art works should we use to go abroad and compete with the world? Sharing and introduction, how the aesthetic value of Chinese painting can be interpreted and promoted in the larger cultural pattern have become issues of the times before Chinese painters.

Table 14. Digital innovation design model based on "FRIZ" theory



On the one hand, the channels and ways for us to understand foreign culture and art have become more diverse and convenient, with a large influx of Western artistic concepts and techniques, and almost all kinds of artistic trends can find references and responses in the Chinese painting world; on the other hand, as China With the rapid improvement of economic and political status, the requirement for China's local culture to gain international recognition has become more urgent than ever. It is hoped that China's contemporary culture and local art can gain recognition in international cultural exchanges to expand their influence and universal value. It has become a strong national cultural appeal.

National cultural characteristics and regional personality often need to be compared, reflected and exchanged among multicultural patterns in order to emerge relatively completely and clearly. The Chinese characteristics, Chinese style, and Chinese style that contemporary Chinese painting embodies and pursues are to

develop Chinese characteristics that contain the nation's excellent traditional culture, real life content, social style, and the spirit of the times, and these contents need to be reflected in a more macro and diverse context. It can only be carried out in the cultural field. In this cultural context, only by taking root in local cultural resources and realistic ideologies can current Chinese painting creation and research be in line with the local atmosphere, cultivate confidence, inject vitality and vitality, and perform its own energy and influence in the world cultural pattern.

Under this logic, just like the iteration of artists as human beings, our discovery and construction of tradition today should not be a rebuilding or reconstruction from scratch, but a project close to additions and continuations. From the perspective of contemporary Chinese painting creation and research, we should not only dive deeply into and absorb traditional resources, break through stereotypes, stereotypes and prejudices about "tradition", and strengthen the research on classic painting books; at the same time, we need to keep pace with the times, Rediscover and activate the inspiring, time-traveling, and universal value of "tradition". Only in this way can we better and effectively explore and utilize traditional cultural resources, and build new heights for local culture and national art.

4.3.5 Summary

To sum up, through the study of the phoenix painting art of Anhui, Anhui Province, we have a deeper understanding of its unique skills and long-standing inheritance, and realize its importance in local cultural inheritance and artistic creation. Further research on the development and promotion of Anhui Phoenix painting art will provide useful enlightenment for the cultural prosperity of Anhui area and research in related fields through the following levels.

As a representative of folk art, Anhui Phoenix Painting is a folk culture with working people as the main body and a group culture and art. Its cultural connotation and artistic form have accumulated profound content. The changes and development

of the content and form of Anhui Phoenix paintings reflect the living conditions and spiritual outlook of the people in Anhui area, Huaibei River Basin and even the whole country in different historical periods. It involves aesthetics, art, history, sociology, folklore, etc. The multi-disciplinary content includes the cultural and academic value of various subject areas. It has extremely high reference value and academic research for us to understand the survival, development, tradition, thought and culture of a region, a country and even a nation, as well as many academic fields. value.

Anhui Phoenix Painting is different from other folk arts in aesthetic value. Unlike other folk arts, it does not have much restrictions on the people who can participate in the creation. Anyone who has the passion for life can create beautiful things. Anhui Phoenix Painting has great influence on the people involved in the creation. The requirements for painting skills are very strict, and only those with a certain foundation in painting can master the process. Therefore, the requirements for the artist's personal aesthetics and personal qualities are quite high. Anhui phoenix painting uses the language of folk art to express the wealth of royal art. It requires the brushwork, shape and artistic conception of the picture to reflect wealth and auspiciousness. The picture pays more attention to the beauty of the artistic conception and has the "elegance" of literati painting. This It is its unique aesthetic value as a folk art.

As a representative of folk art, Anhui Phoenix Painting is also a continuation of primitive art. It inherits and develops the coexistence of practicality and aesthetics of primitive art. It represents the historical process and social style of the entire society and is inseparable from the process of human survival. The side shows the social development in different periods. The content it expresses and the ideological connotation it conveys, as well as the people's attitudes and expectations for social life reflected, have become important basis for supporting history and are important for studying the development and appearance of society.

CHAPTER V

Conclusion, Discussion and Suggestion

This chapter focuses on the construction of a digital space model and its practical application in Anhui Phoenix Painting through previous research and summary. It is committed to achieving the effective integration of digital image core construction, image reproduction, and emotional narrative, and endowing intangible cultural heritage with a synchronous development model in the digital era. Compared with traditional design paradigms, innovative digital image design in terms of technical performance The characteristics of the times and collaborative growth have obvious advantages.

Research objectives

- 1.To study the historical origins, artistic value and cultural identity of Anhui phoenix painting art.
- 2.To study the image composition, aesthetic characteristics and innovative applications of Anhui phoenix painting art.
3. To study the application paradigm of Anhui phoenix painting art in digital innovation design in the new era.

5.1 Conclusion

5.1.1. The field of historical origins, artistic value and cultural identity in Anhui phoenix painting art.

5.1.2. The form of image composition, aesthetic characteristics and innovative applications in Anhui phoenix painting art.

5.1.3. The structure of the application paradigm of Anhui phoenix painting art in digital innovation design in the new era.

5.2 Discussion

5.2.1 Feasibility analysis of digital technology application

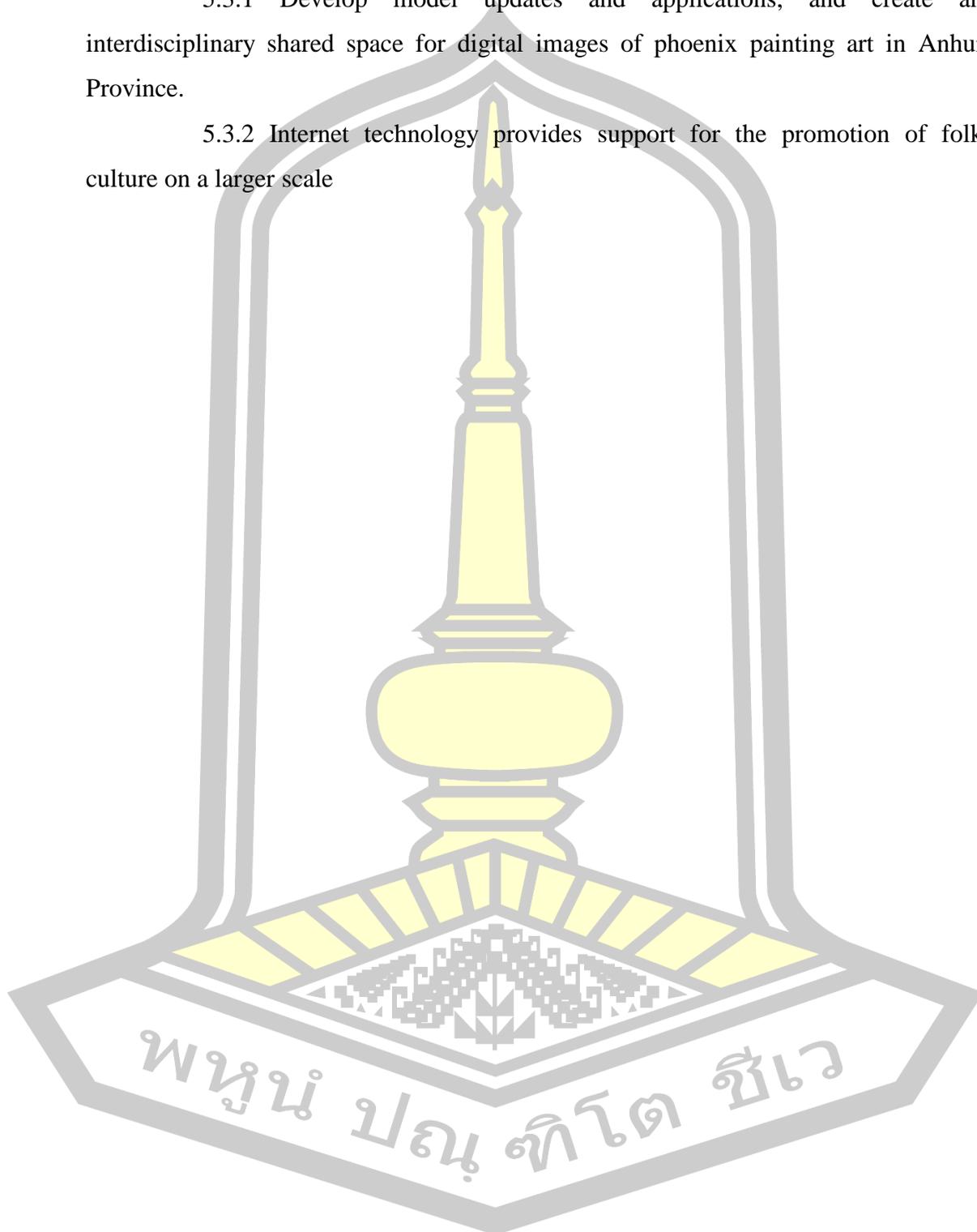
5.2.2 Digital innovation design integration and function development process

5.2.3 Simulation interaction technology provides a platform for virtual restoration of Anhui Phoenix art.

5.3 Suggestions

5.3.1 Develop model updates and applications, and create an interdisciplinary shared space for digital images of phoenix painting art in Anhui Province.

5.3.2 Internet technology provides support for the promotion of folk culture on a larger scale



5.1 Conclusion

With the advent of the digital age, digitization and intelligent carriers have become the mainstream context of current design, and the design environment is gradually moving towards digitization across the board. Interface design, as an art form that uses graphic design as a radiant link to computer technology and scientific and technological materials, has evolved from digital screens to Visual carriers have been transformed into content-driven communication carriers and are an important medium for communication between humans and machines. Research by Gong, Susan P and Andrew S. Gibbons points out that many design efforts only consider the surface value of the final product without considering the underlying structural issues of the interface. Decomposing an interface design problem into multiple interrelated design sub-problems allows designers to more accurately focus decisions on smaller, more tractable problems while promoting overall design consistency. The research illustrates several important design concepts: the value of using a functional architectural skeleton, the value of specifying the minimum set of required functionalities, the need to set up design presentation tools that preserve the underlying logic of the architecture when the design changes, and the principle of hierarchy in page detail design. value, and the unexpected logic that produces a "surface-last" design order, etc.

Therefore, the digital innovation design application paradigm must more accurately express the ontological requirements and essential connotation of its design in the digital era. It must be based on the core demands of users, fully solve the practical problems of user screen terminal performance, and guide students to develop interface products that meet user needs. Enable users to connect and communicate with each other both inside and outside the screen.

5.1.1. The field of historical origins, artistic value and cultural identity in Anhui phoenix painting art.

As far as the name is concerned, the core of digital innovation design is the content expression of interface design in the digital and intelligent field, and its ontology is the technical expression of the digital and intelligent field. Digital Innovation Design uses the expression form of digital intelligence technology as the starting point to discuss the relationship between the "form" and "structure" of design

with students. The contents discussed are all within the scope of technical expression in the field of digital intelligence. . Discussing the "form" and "structure" of digital innovation design in the context of the digital intelligence field mainly discusses how digital technology, intelligent carriers and other related media can effectively convey information to users in the field.

"Form-driven structure" is to base digital innovative design on the object position in the digital and intelligent field, so that users can accurately identify the effective information of the product in the current environment, and realize the implementation of digital innovative design in the digital and intelligent field. Iterative development. The starting point and foothold of this paper's thinking on the relationship between "field", "form" and "structure" are: first, to regard digital innovation design as the goal of science and technology and design in the digital and intelligent field, and to realize science and technology The learning cycle with design expression as the goal; the second is the experimental link as the teaching process of digital innovation design, which has the meaning of "practice and experiment" and regards the practice process as an important experimental learning method.

5.1.2. The form of image composition, aesthetic characteristics and innovative applications in Anhui phoenix painting art.

Digital innovation design refers to the combination of digital intelligence technology and form. The thinking about "form" mainly focuses on three levels. The first is the perception of the ontology content of digital innovation design, which mainly refers to the information between users and digital innovation design. Delivery and overall experience, including the user's psychological process during the experience; the second is the choice of digital technology, which mainly refers to the effective connection and interaction between digital media and digital innovative design, including the body, shape, and form of digital innovative design. Various combinations of quantity and materials; the third is the presentation of the digital innovation design display carrier, mainly the unity of the intelligent carrier and interface expression between the exponentially intelligent carrying terminal and the digital innovation design, including the carrier form, information All aspects of structure and load-bearing requirements.

As a new concept driven by digital technology, digital image innovative design has just begun to be explored in practice in the intangible cultural heritage represented by Anhui Province's phoenix painting art. In the process of development, it must cooperate with more diverse digital technologies, Innovative concepts evolve and grow simultaneously, exploring the inherent mechanism, operating paradigm and inheritance path of images, enriching the theoretical model of digital image innovative design, and combining more practical cases to test the objectivity and scientific of digital image theory. In addition, cross-disciplinary and cross-industry technologies, concepts and evolutionary methods should be absorbed more openly, and in the wave of digital development, we should use a strong technical form to promote the innovation of innovative design paradigms of intangible cultural heritage, and realize the empowerment of Chinese culture by digital images. construction.

5.1.3. The structure of the application paradigm of Anhui phoenix painting art in digital innovation design in the new era.

The concept of digital innovation design refers to the connection and unity of digital innovation design structure and digital intelligence structure. It mainly reflects the structure of digital innovation design from two aspects: the sustainable development and utilization of digital innovation design ontology and the carrying mode of digital intelligence structure. relation. The sustainable development and utilization of digital innovative design ontology carries the multi-dimensional expression of visual information, realizes the basic functions of digital innovative design such as storage, transmission, display and use of content, and is in line with the scientific rationality of ergonomics; digital intelligence structure and The connection between the digital innovation design ontology is the expression of the environmental relationship of the digital intelligence field and the information level of digital innovation design. The unity is the interaction between the characteristics of the two "structures" of user experience and the interaction between users.

"Form-driven structure" is to base digital innovative design on the object position in the digital and intelligent field, so that users can accurately identify the effective information of the product in the current environment, and realize the implementation of digital innovative design in the digital and intelligent field. Iterative development. The starting point and foothold of this paper's thinking on the

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Digital innovative design provides basic logic and event framework for artistic images, and provides multi-level digital technology and digital space paths for intangible cultural heritage from technology holders, skill creators to skill inheritors. In this article, the author focuses on constructing a digital space model and its practical application in the phoenix painting art of Anhui Province. It is committed to realizing the core construction of digital images, the effective integration of image reproduction and emotional narrative, and giving the intangible cultural heritage synchronization in the digital age. Development model, compared with traditional design paradigms, digital image innovative design has obvious advantages in technical performance, era characteristics and collaborative growth.

Guided by understanding the representational characteristics and cultural attributes of Anhui Phoenix art images, absorbing relevant theoretical achievements and practical paths of sociology, psychology and digital innovation design, we analyze the events, creative emotional expressions and non-temporal relationships of Anhui Phoenix art. The conceptual framework conducts multi-angle inspections to systematically describe and understand the unique artistic and cultural attributes of Anhui Phoenix artistic images.

5.2 Discussion

Through the research and analysis of the representational characteristics of Anhui Phoenix art graphics and the practical path of digital innovative design, it reveals the digital transformation of the living inheritance of such intangible cultural heritage projects and its application paradigm, and realizes the practical path of digital innovative design of different art and cultural projects, and The intrinsic relationship between digital innovation and cognitive performance in art and cultural projects.

Digital innovative design is to use virtual reality technology and three-dimensional simulation technology to objectively and truly digitally restore

documents, patterns, performances, crafts, objects and other carriers related to folk cultural content. Through standardized information collection, relevant data resources can be optimized, integrated, classified, retrieved and saved in batches, thereby achieving the purpose of information integration, protection and management of digital resources.

5.2.1 Feasibility analysis of digital technology application

The maturity of virtual reality (VR) and augmented reality technology (AR) has created a new development platform for folk culture data collection, storage and integrated development. Its information acquisition mainly includes three-dimensional scanning, motion capture, high-definition photography, holography, etc.; digital storage technology models mainly include network-attached storage, direct-connected storage, storage area network and connected devices. Through digital information acquisition and storage technology, folk cultural resources such as original text, graphics, images, and physical objects can be converted into digital formats. After unified and standardized processing, system integration can be completed and stored in the database of the virtual platform. In addition, in order to facilitate information retrieval, management and update of resources, a digital resource management platform can be loaded to improve the efficiency of Anhui Phoenix Art's digital innovation design.

5.2.2 Digital innovation design integration and function development process

Digital innovation design is a technology that uses modern computing and communication means to comprehensively process text, sound, graphics, images and other information, turning abstract information into perceptible, manageable and interactive technology. The basic workflow of this technology in the application of Anhui phoenix painting art is: 1) Use data management technology to classify folk culture and establish a database, and collect and classify various folk culture data according to certain standards; 2) Use software technology to assist design Organize and repair old and damaged images and video materials, divide and integrate the optimized images, videos, audios, and model data into functional modules for storage; 3) Through research and analysis of Anhui Phoenix art data, use three-dimensional restoration technology The application restores simulated scenarios such as Anhui

Phoenix art lifestyle and cultural communication forms, including traditional handicrafts; 4) Use virtual reality and augmented reality technology to integrate resources such as models and scenes after the restoration of folk culture and perform various animations Demonstration and interactive function settings; 5) Use Internet technology to open and disseminate integrated system platform resources.

5.2.3 Simulation interaction technology provides a platform for virtual restoration of Anhui Phoenix art

Due to the rapid development of society and economy, modern production and lifestyles have undergone earth-shaking changes, making it more difficult to inherit the art of Anhui Phoenix. With the development of technologies such as digital image processing, virtual restoration, augmented reality, and 3D engines, folk culture can be highly restored through three-dimensional visualization to achieve the purpose of protecting and inheriting folk culture. Among them, virtual restoration technology can restore and display the scenes and dissemination processes of folk culture; use virtual reality human-computer interaction immersive equipment, combined with character positioning, scene generation and other technologies, to link virtual space resources such as three-dimensional models, videos, interactive hotspots, etc. Achieve multi-directional, multi-angle three-dimensional display and simulated interaction between visitors and virtual objects in a visualized real scene, transforming Anhui Phoenix art dissemination from passive acceptance to active participation, mobilizing learning interest and enthusiasm, virtual platform development flow chart as the picture shows.

5.3 Suggestions

5.3.1 Develop model updates and applications, and create an interdisciplinary shared space for digital images of phoenix painting art in Anhui Province.

Relying on modern digital innovation technology, the subjective construction, spatial meaning, transformation narrative and other elements of such intangible cultural heritage project "relators" (technology holders, skill creators and skill inheritors) are effectively integrated into each other. While achieving artistic inheritance and development under new technological conditions, we can also realize its shared value in the Chinese cultural panorama.

Generally speaking, the focus and difficulty of the modern transformation of Anhui's phoenix painting art tradition does not lie in the realistic foundation and modeling ability to express current social life, nor does it lie in the development of Western modernism using rice paper and ink as a medium. Conceptual experiment, but by absorbing the tradition of pen and ink, expressing the subjective spirit, so that it can complete the extension of the inner spirit of the Chinese people. Among them, the huge difference between the spirit of traditional Chinese culture and contemporary social life has become an insurmountable problem for all Chinese painters. It also provides rich resources for the renewal of themes and painting techniques. From a certain perspective, the biggest issue facing the Chinese painting tradition is thinking about the development direction and cultural identity of Chinese painting, or in other words, the strategy of how Chinese traditional art adapts and evolves in the local social and cultural context. Especially since the new century, the Chinese painting world has faced a broader international perspective. Chinese painters have given more consideration to establishing the self-cultural identity of Chinese painting on a global scale and realizing the extension of its cultural vitality for dynamic development.

Since entering the new era, the cultural context of Anhui phoenix painting art has undergone many changes. How does Chinese cultural tradition present its constructive value of "peace" and "inclusiveness"? How to examine the local cultural identity through reflexive observation and actively and effectively How to properly respond to Anhui phoenix painting art and even creative issues in the field of painting in the age of images? In this cultural context, thinking about the values of Chinese contemporary art and discussions around the relationship between tradition and innovation have always continued: What kind of art works should we use to get out of the world? Sharing and introducing the Anhui phoenix painting art with the world, how the aesthetic value of Anhui phoenix painting art can be interpreted and promoted in the larger cultural pattern has become a contemporary issue before artists. On the one hand, the channels and ways for us to understand foreign culture and art have become more diverse and convenient, with a large influx of Western artistic concepts and techniques, and almost all kinds of artistic trends can find references and responses in the Chinese painting world; on the other hand, as China With the rapid improvement of economic and political status, the requirement for

China's local culture to gain international recognition has become more urgent than ever. It is hoped that China's contemporary culture and local art can gain recognition in international cultural exchanges to expand their influence and universal value. It has become a strong national cultural appeal.

National cultural characteristics and regional personality often need to be compared, reflected and exchanged among multicultural patterns in order to emerge relatively completely and clearly. The Chinese characteristics, Chinese style, and Chinese style embodied and pursued by contemporary Anhui phoenix painting art are to show Chinese characteristics that contain the nation's excellent traditional culture, real life content, social style, and the spirit of the times, and these contents need to be more comprehensive. displayed in a macro and diverse cultural field. In this cultural context, only by taking root in local cultural resources and realistic situations can the current creation and research of Chinese paintings be in line with the local atmosphere, cultivate confidence, infuse vitality and vitality, and show its own energy and influence in the world cultural pattern.

5.3.2 Internet technology provides support for the promotion of folk culture on a larger scale

With the development of the Internet and digital display technology, many digital Anhui Phoenix art products have been integrated on the digital display system, using intelligent terminal applications and Internet technology to create an online Anhui Phoenix art display platform, such as the developed digital Anhui Phoenix art display platform. The Painting Art Museum system can be applied to PC and mobile terminals. Through network interconnection, the database resources in the Anhui Phoenix art Network are continuously enriched into the folk cultural resources online display platform. This will lower the threshold for people to acquire knowledge about Anhui Phoenix art, expand the spread and audience of Anhui Phoenix art, maximize resource sharing, and promote folk culture on a larger scale.

Digital innovative design, as the spirit of design expression, has gradually developed with the widespread use of computer technology in the design field. Taking Anhui Phoenix art as the starting point, digital images and computer graphics of general images are more obvious general computer graphics and images are the direct products of science and technology and media technology. Digital images in the field

of design art are not only the result of the development of computers and digital technology, but also the result of designers' artistic creation. It is a special term based on the experience of digital technology and visual results. Information technology has given birth to new creative methods, showing people the infinite vitality of designed and created images in the new era. This rebirth can be material, or it can be virtual and non-material.

As an important part of regional cultural genes, intangible cultural heritage plays an indispensable role in the development of excellent traditional culture. With the rapid development of digital technology, the combination of intangible cultural heritage and artificial intelligence digitization has received widespread attention. Computer technology not only provides a new way of thinking for the protection and inheritance of intangible cultural heritage, but also brings more application potential to intangible cultural heritage. In addition, the diversity of intangible cultural heritage also provides rich application scenarios for computer technology. The digitization of intangible cultural heritage has profound interdisciplinary connections. It uses advanced technology to achieve a revolutionary breakthrough in the digital protection and inheritance of regional cultural heritage, providing a wider range of choices and opportunities for the development of Chinese traditional culture.

The application of digital innovative design is not only a tool for expressing expressions, but also a traditional narrative medium. As one of the important propositions that the design world is paying attention to at the moment. As a visual text, digital innovative design not only narrates and depicts the trajectory of human existence, but also plans and constructs people's cognition and expression. Therefore, images are not only narrative methods and media, but also forms of visual design and expression. Digital innovative design is a new member of the image spectrum. It is a visual presentation method born from the joint development of image technology and media technology.

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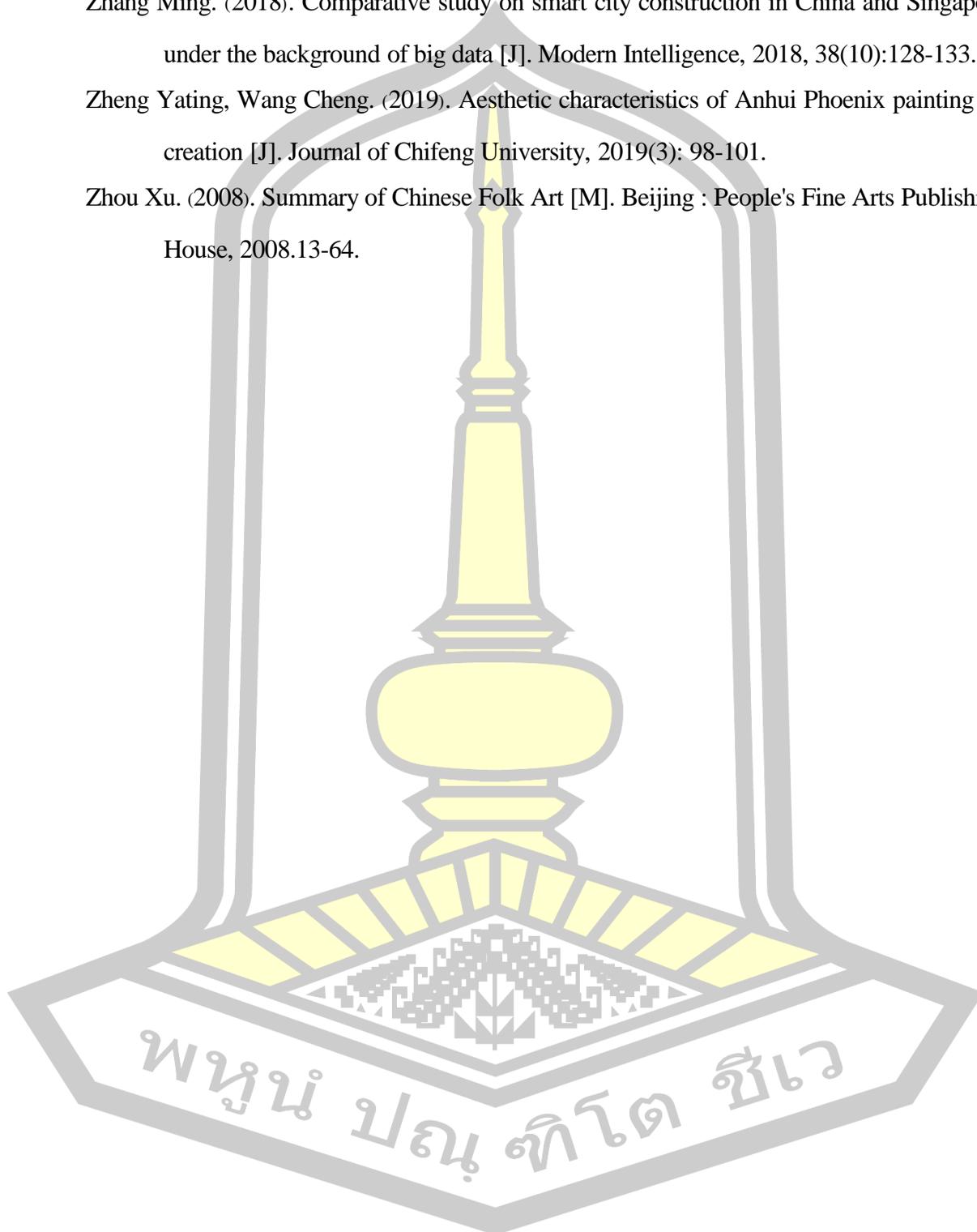
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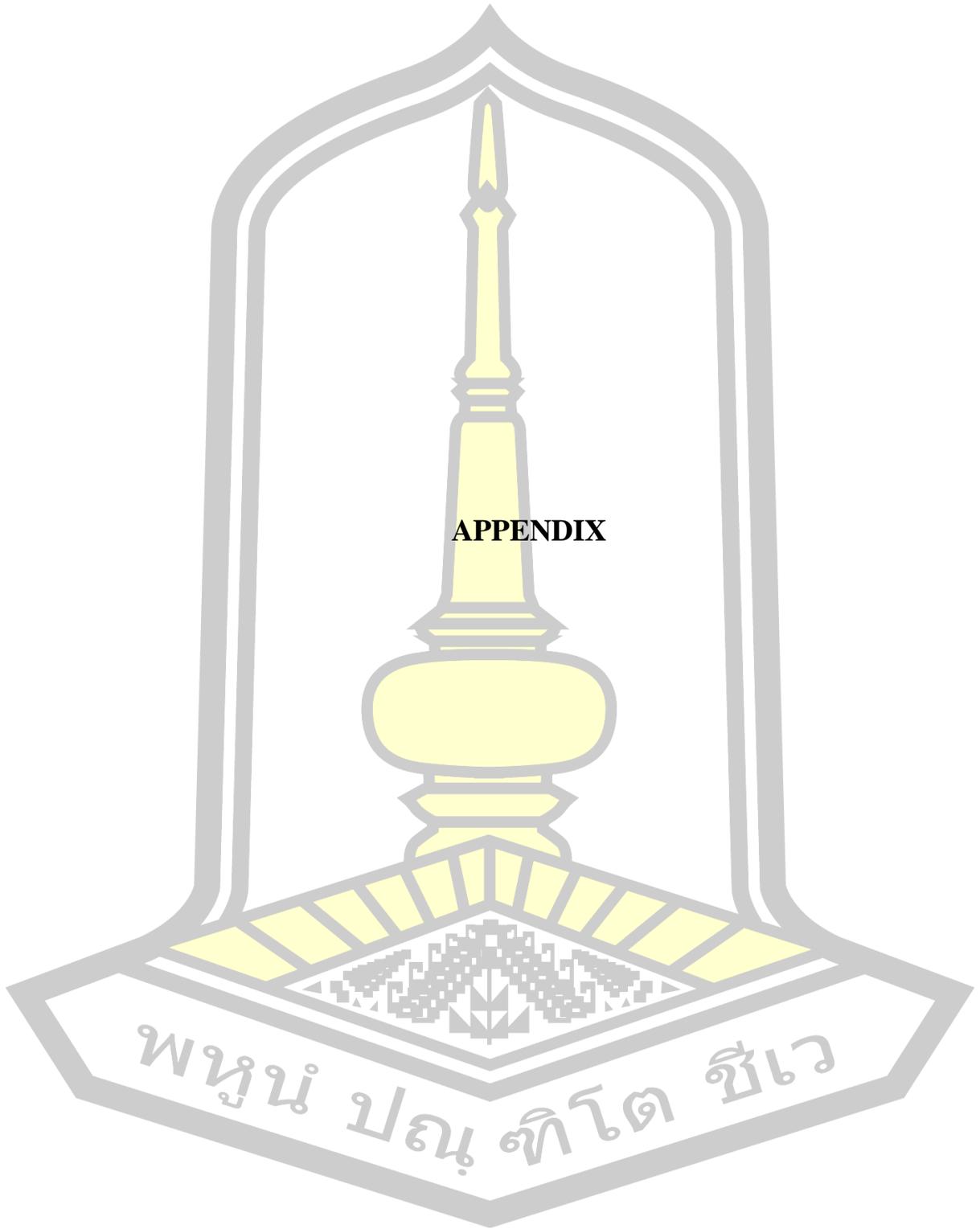
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APPENDIX

พหุบัณฑิตยาลัย จุฬาลงกรณ์มหาวิทยาลัย

Appendix 1

Anhui Phoenix Art User Needs Survey Questionnaire

Dear Sir/Madam: Hello!

I'll take two minutes of your time here. Thank you for taking the time to fill out this questionnaire. With the advent of the information age, Anhui phoenix painting art has gradually entered the public eye. This questionnaire is a study on the user needs of Anhui Fengfeng Painting Art, and the digital innovative design of Anhui Fengfeng Painting Art is based on user needs. This survey is conducted anonymously. In order to obtain accurate data, please answer the questions in the questionnaire based on the actual situation. Thank you for your support!

1. Your gender

A: Male; B: Female

2. Your ethnicity

A: Han; B: Other ethnic minorities

3. Do you know the art of Anhui phoenix painting?

A knows a lot; B knows a little; C doesn't know

4. If there are Anhui Fengfeng paintings on the market, would you be willing to buy them?

A: Yes; B: Generally; C: No

5. When designing digital innovations at Anhui Phoenix Art, which aspects of design do you pay more attention to?

A: Practicality; B: Comfort; C: Safety; D: Artistry; E: Craftsmanship; F: Economy; G: Matching; H: Environmental protection

7. What aspects would you like to improve during the digital innovation design of Anhui Phoenix Art?

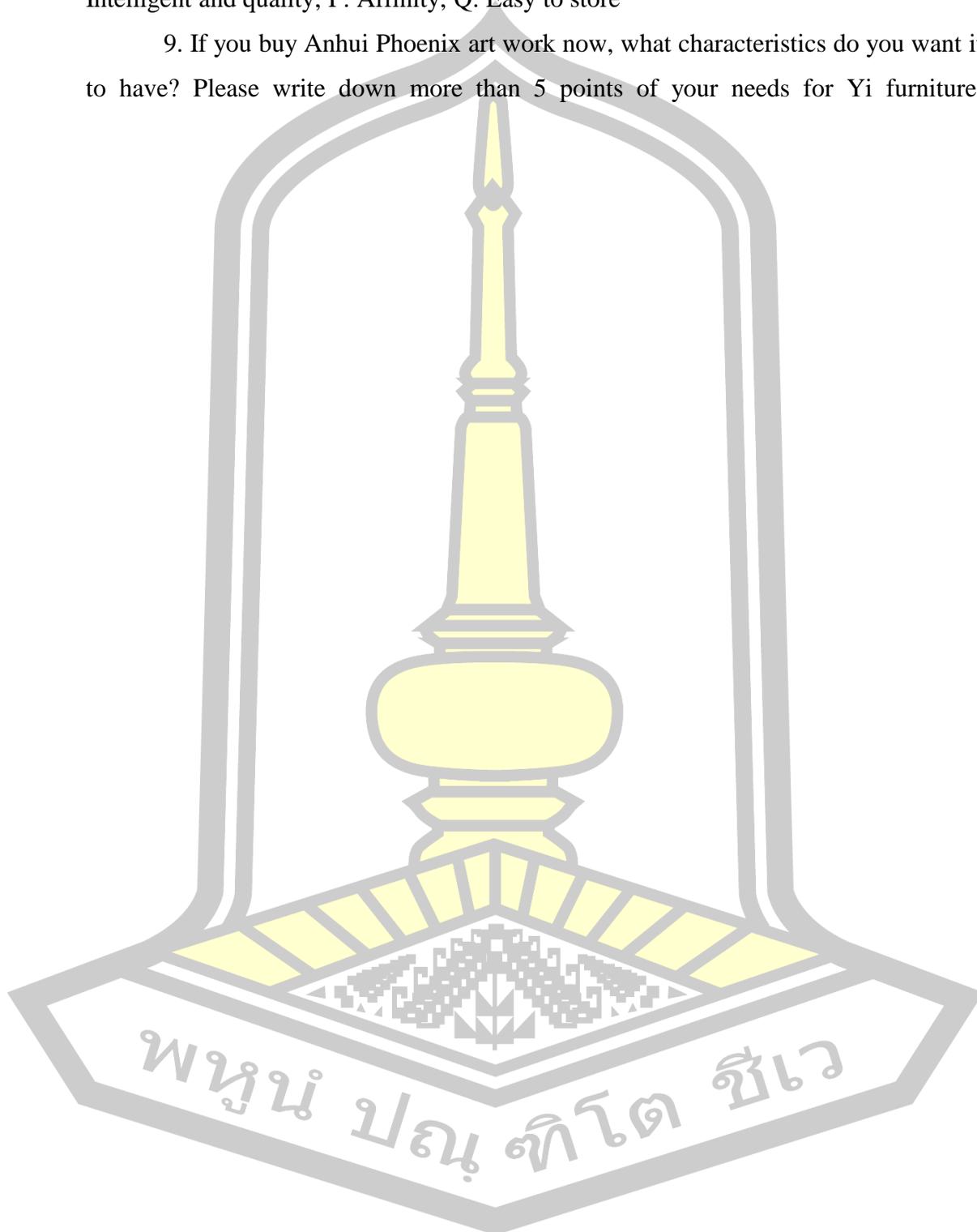
A: Shape; B: Color; C: Texture; D: Decoration; E: Function; F: Size; G: Material; H: Structure

8. What kind of Anhui phoenix painting art works do you like?

A: Simplicity; B: Luxury; C: Traditional; D: Comfort; E: Beautiful; F: Multifunctional; G: Strong and durable; H: Easy to clean; I: Detachable; J:

Removable; K: Fun ; L: Personalized; M: Cultural connotation; N: Affordable; O: Intelligent and quality; P: Affinity; Q: Easy to store

9. If you buy Anhui Phoenix art work now, what characteristics do you want it to have? Please write down more than 5 points of your needs for Yi furniture.



Appendix 2

Anhui Phoenix Art Digital Innovation Design TRIZ Model User Satisfaction Survey Questionnaire

Dear respondent:

With the development of the times, the unique Anhui phoenix painting art has gradually been recognized by the public and has subtly influenced the manufacturing process, color, shape, materials and decorative patterns of Anhui phoenix painting art. This questionnaire uses positive and negative extreme values to obtain the user satisfaction coefficient, testing your emotional tendency when Anhui Phoenix Art has or does not have a certain functional trait, which is helpful for designers to realize the shortcomings of Anhui Phoenix Art's digital innovation design and improve it to better serve the user community. In order to obtain accurate data, please answer according to the actual content of the questionnaire. This survey will be conducted anonymously.

Thank you for your patient answer!

1. If the art of Anhui phoenix painting is beautiful and harmonious/unsightly, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

2. If Anhui phoenix painting art is strong and durable/not strong and durable, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

3. If the function of Anhui Phoenix art is clear and reasonable/the function is not clear and reasonable, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

4. What do you think if Anhui Phoenix Art is easy to move/not easy to move?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

5. What do you think if Anhui Phoenix art can be disassembled/cannot be disassembled and assembled?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

6. What do you think if Anhui Phoenix Art becomes intelligent/unintelligent?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

7. What do you think if Anhui Phoenix Art is easy to store/not easy to store?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

8. If the structure of Anhui Phoenix art is stable/unstable, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

9. If Anhui Phoenix Art is easy to carry/not easy to carry, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

10. If Anhui Phoenix Art has visual guidance on the use of functions/no visual guidance on the use of functions, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

11. If the shape and decoration of Anhui phoenix painting art are simple and elegant/the shape and decoration are not simple and elegant, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

12. If Anhui Phoenix art materials have texture/materials have no texture, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

13. If Anhui phoenix painting art has national characteristics and cultural connotations/doesn't have national characteristics and cultural connotations, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

14. If Anhui phoenix painting art has a classical charm/doesn't have a classical charm, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

15. If Anhui Phoenix Art meets/does not meet individual needs, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

16. If Anhui phoenix painting art is interesting/uninteresting, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

17. If Anhui Phoenix art gives people a sense of intimacy and belonging/doesn't give people a sense of intimacy and belonging, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

18. What do you think if Anhui phoenix painting art has a sense of design and is versatile/has no sense of design and is not versatile?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

19. If the patterns and colors of Anhui phoenix painting art are harmonious and comfortable/the patterns and colors are not harmonious and comfortable, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

20. What do you think if Anhui phoenix painting art can be effectively integrated into the indoor space environment/cannot be effectively integrated into the indoor space environment?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

21. What do you think if Anhui Phoenix Art is easy to clean/not easy to clean?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

22. What do you think if the Anhui Phoenix art shape is lightweight/the furniture shape is not lightweight?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

23. If the surface pigments of Anhui Phoenix Art have no odor/the surface pigments have odor, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

24. What do you think if the waste materials of Anhui Phoenix Art can be recycled and reused/the waste materials cannot be recycled and reused?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

25. If the parts of Anhui Phoenix Art can be replaced after the structure is damaged/the parts cannot be replaced after the structure is damaged, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

26. If Anhui phoenix painting art is cheap, high-quality, and good value for money/if it is not cheap, high-quality, and not good value for money, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

27. If Anhui Phoenix Art is easy to pack and transport/is not convenient to pack and transport, what do you think?

A satisfied; B should be like this; C doesn't matter; D reluctantly accepts; E dissatisfied

Appendix 3

Anhui Phoenix Art Digital Innovation Design Quality Evaluation Survey Questionnaire

Dear interviewee: Hello!

The purpose of this questionnaire is to evaluate the quality of ten digital innovative design works of Anhui Phoenix Art based on the path of "symbols, information, and interaction". This questionnaire is mainly designed for the user group of Anhui Phoenix Art. Please according to the design instructions and pictures, please assign quality values to the ten works according to the 21 functional elements of Yi furniture innovative design user needs shown in Table 1, and take the values. is [-2,- 1,0, 1,2]. Among them, 2 is excellent; 1 is good; 0 is average; -1 is average; -2 is poor. In order to obtain accurate data, please consider each option based on actual conditions. Please rate and evaluate, thank you for your participation!

Table 15. User demand functional elements of Anhui Phoenix Art digital innovation design based on TRIZ theory

Attribution category	Functional elements of user requirements
Basic needs (M)	W2 is strong and durable, W3 has clear and reasonable functions, W4 is easy to move, W5 can be disassembled and assembled, W8 has a stable structure, Y1 is easy to clean, Z2 is easy to pack and transport
Desirable needs (O)	W1 is safe and comfortable, X1 has simple and elegant shape and decoration, X7 gives people a sense of intimacy and belonging, X9 has harmonious and comfortable patterns and colors, X10 can effectively integrate into the indoor space environment, Y2 has a lightweight shape, Y3 has a surface painted with no odor, Z1 is cheap.
excitement needs (A)	W10 has visual guidance on usage functions, X2 has high-quality materials, X3 has national characteristics and cultural connotations, X5 meets individual needs, X6 is interesting, and X8 has a sense of design and can be used in many styles.

4.2.1 Feng-Jing: Innovative design and application of digital images in the context of folk customs

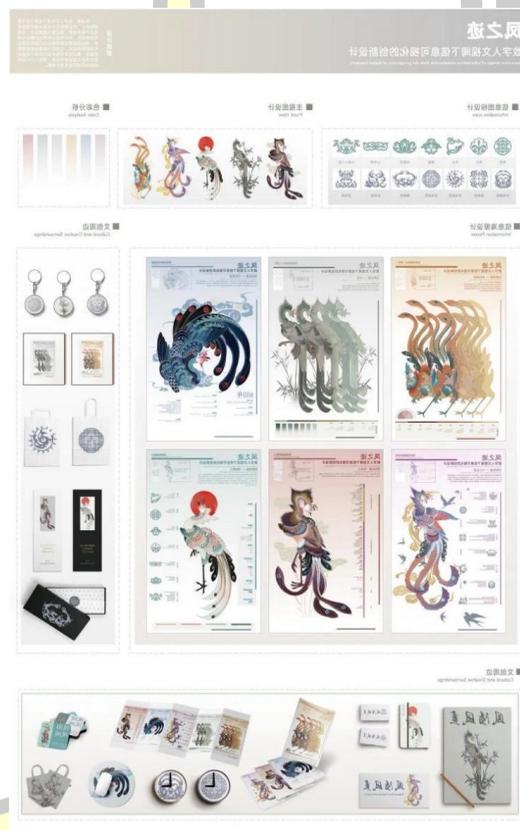
This work "Innovative Design and Application of Digital Images in the Folklore Context" selects Anhui Phoenix Painting Art in Anhui Province as the theme. The main research content is the innovative design and application of font graphics through related elements of Anhui Phoenix Painting classic art works. , using the innovative design of digital images as a starting point to conduct exploratory research to help the audience better understand the art of Anhui Phoenix Painting in Anhui Province and realize the innovative inheritance and development of Anhui Phoenix Painting.



	M	W2	W3	W4	W5	W8	Y1	Z2	
4.2.1	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.2 Traces of the Wind: Innovative Design of Information Visualization from the Digital Humanities Perspective

The main source of data for designing infographics for this topic. We collected the representative works of Anhui Phoenix Painting artists, digitized them, and annotated the relevant information to form a complete set of Anhui Phoenix Painting infographic designs.



4.2.2	M	W2	W3	W4	W5	W8	Y1	Z2	
	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.3 Yuanfeng·Zang: Narrative interactive practice and application of picture book design in the era of digital intelligence

This work is "Narrative Interactive Practice and Application of Picture Book Design in the Digital Intelligence Era". In today's era, there is a large vacancy in original picture books in the domestic market. It is created and spread based on Anhui Phoenix Painting, an intangible cultural heritage of folk art. Domestic folk culture and promotion of intangible cultural heritage.



	M	W2	W3	W4	W5	W8	Y1	Z2	
4.2.3	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.4 Chufeng·Qing: Innovative design practice and application of dynamic graphics based on emotional expression

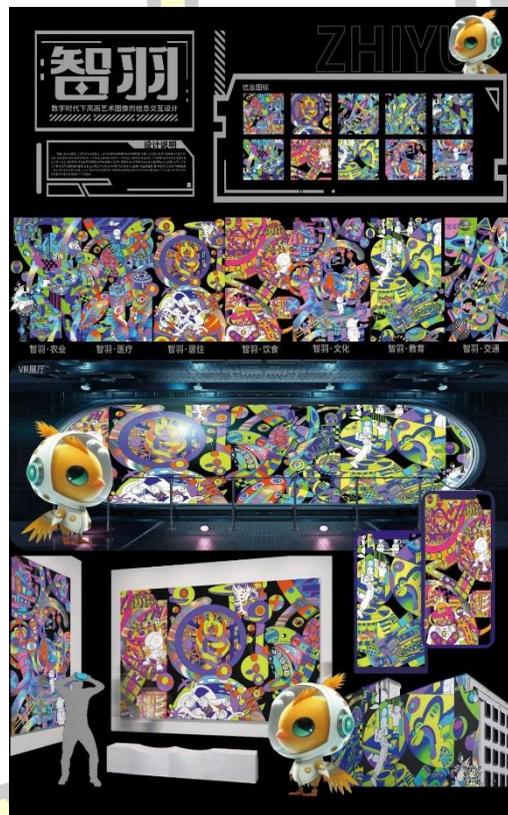
This work "Practice and Application of Innovative Design of Dynamic Graphics Based on Emotional Expression" uses dynamic graphic design presentation methods to allow more audiences to understand and understand Anhui Phoenix Painting, and to inject new vitality into Anhui Phoenix Painting. Through the investigation and research of this topic, it can be concluded that dynamic graphic design currently has good development prospects in promoting cultural communication and development.



4.2.4	M	W2	W3	W4	W5	W8	Y1	Z2	
	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.5 Zhiyu: Information interaction design of phoenix painting art images in the digital era

The purpose of this project design is to realize the digital presentation and information transmission of phoenix painting art images. Digital presentation enables the phoenix painting art images to be displayed on more terminal devices and applications, so that more people can understand and learn the charm of phoenix painting art. and cultural connotation.



	M	W2	W3	W4	W5	W8	Y1	Z2	
4.2.5	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.6 Shape of Phoenix: Digital innovation design and practice of brand image based on graphic language

Through the intervention of graphic language in brand image design and the use of digital design, this work makes brand image design break the original development boundaries and become a better way to promote cultural communication and development.



4.2.6	M	W2	W3	W4	W5	W8	Y1	Z2	
	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.7 Luanxiang·Fengji: Innovative design and research of digital picture books in the new era

The research and exploration of this work "Innovative design and research of digital picture books in the new era" is the main content. It integrates the expression of the spirit of the new era and the cultural spirit of phoenix paintings into the digital picture books, so that the audience can feel the infection of the spirit of the times and spread the new era to the greatest extent. Spirituality and traditional culture of phoenix painting.



4.2.7	M	W2	W3	W4	W5	W8	Y1	Z2	
	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.8 Ya·Song: Innovative design and application of digital characters based on intentional narrative

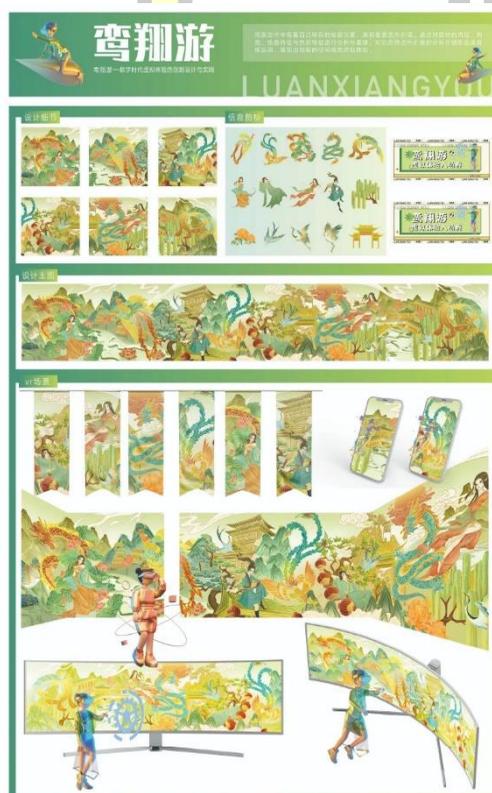
This project selects Anhui style painting as the main theme for innovative digital character design, and combines the images of nine phoenixes for re-innovation. They are blue phoenix, peacock, fire phoenix, snow phoenix, golden phoenix, gale, thunderbird, colorful phoenix, and big phoenix. Peng uses digital characters as an important element of visual expression to achieve rich picture effects and visual art delivery.



4.2.8	M	W2	W3	W4	W5	W8	Y1	Z2	
	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

4.2.9 Luanxiangyou: Innovative design and practice of virtual experience in the digital era

This work is based on the design of virtual experience with Anhui Phoenix Painting as the background, explores the construction characteristics of Anhui Phoenix Painting, extracts the original elements of Anhui Phoenix Painting, digitally utilizes the elements of Anhui Phoenix Painting from a design perspective, and Combined with innovative language, the virtual experience design and Anhui phoenix painting art design elements were summarized and sorted out.



4.2.9	M	W2	W3	W4	W5	W8	Y1	Z2	
	O	W1	X1	X7	X9	X10	Y2	Y3	Z1
	A	W10	X2	X3	X5	X6	X8		

Appendix 4

List of interviewees

Key Informants

Interviewees with Mr. Tang Zhiqin (Fengyang City. Workshop of MR. Tang and interviewer Gu shankai on May 1, 2023. (Cultural expert)

Interviewees with Mr. Zhang Weiwu (Fengyang City. Fenghua Art Museum) and interviewer Gu shankai on April 21, 2023. (Government officials)

Interviewees with Mr. Wang Jinsheng ((Fengyang City. Chunzhou) and interviewer Gu shankai on July 12, 2022. (National level inheritor)

Interviewees with Mr. Chen Haizhen (Fengyang City. Workshop of Mr. Chen)and interviewer Gu shankai on June 28, 2022. (National level inheritor)

Casual Informants

Interviewees with Ms. Zhao Lu (Hangzhou City in Zhejiang) and interviewer Gu shankai on April 17, 2022. (Teacher & Digital media expert)

Interviewees with Mr. Zuo Tiefeng (ChunZhou University in Anhui) and interviewer Gu shankai on April 26, 2022. (Dean of ChunZhou university)

Interviewees with Ms. Chong Rongrong (offices in ChunZhou university) and interviewer Gu shankai on March 8, 2023. (Professor at Chuzhou University)

Interviewees with Ms. Zhang Jing (Government offices in chunzhou) and interviewer Gu shankai on June 22, 2023. (Government worker)

Interviewees with Mr. Liu Aiwei (ChunZhou university in Anhui) and interviewer Gu shankai on October 11, 2022. (Teacher & Digital media expert)

Interviewees with Mr. Zhang Xiaoyi (ChunZhou university in Anhui) and interviewer Gu shankai on April 23, 2023. (Teacher)

Interviewees with Mr. Zhu Jiachuang (ChunZhou university in Anhui) and interviewer Gu shankai on March 8, 2022. (Digital media student)

General Informants

Interviewees with Mr. Liu Xiao (Fengyang in Chunzhou) and interviewer Gu shankai on April 18, 2022. (Local villagers)

Interviewees with Mr. Zhou Yiheng (J Fengyang in Chunzhou) and interviewer

Gu shankai on May 16, 2022. (Fenghua enthusiasts)

Interviewees with Ms. Chen Yi (Fengyang in Chunzhou)) and interviewer Gu shankai on April 24, 2023. (Student)

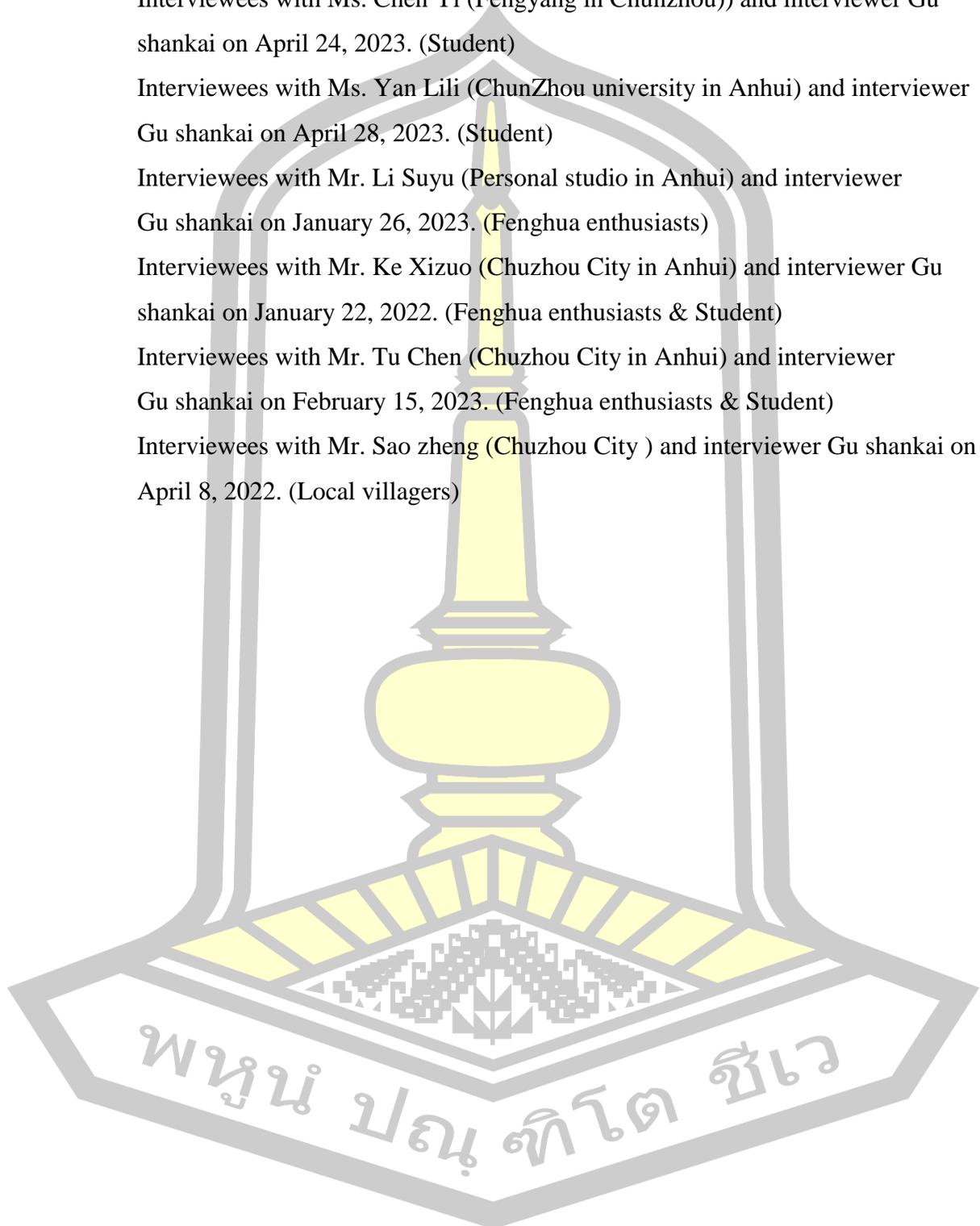
Interviewees with Ms. Yan Lili (ChunZhou university in Anhui) and interviewer Gu shankai on April 28, 2023. (Student)

Interviewees with Mr. Li Suyu (Personal studio in Anhui) and interviewer Gu shankai on January 26, 2023. (Fenghua enthusiasts)

Interviewees with Mr. Ke Xizuo (Chuzhou City in Anhui) and interviewer Gu shankai on January 22, 2022. (Fenghua enthusiasts & Student)

Interviewees with Mr. Tu Chen (Chuzhou City in Anhui) and interviewer Gu shankai on February 15, 2023. (Fenghua enthusiasts & Student)

Interviewees with Mr. Sao zheng (Chuzhou City) and interviewer Gu shankai on April 8, 2022. (Local villagers)



BIOGRAPHY

NAME	Shankai Gu
DATE OF BIRTH	03/08/1993
PLACE OF BIRTH	Jiang su province, China
ADDRESS	265 Jiangdong Middle Road, Jianye District, Nanjing City, Jiangsu Province
POSITION	Lecturer, Chuzhou University
PLACE OF WORK	Chuzhou, Anhui province, China
EDUCATION	2011-2015 Luxun Academy of Fine Arts, Bachelor degree. 2016-2019 Luxun Academy of Fine Arts, Master degree. 2020-2024 (Ph.D.) Faculty of Fine-Applied Arts and Cultural Science, at Mahasarakham University in Thailand.

