

Intelligent Design and Application of Uygur Flower Hats for The Elderly

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Abstract—This paper analyzes Uygur flower hats based on Uygur traditional culture. Based on the practical needs of the Uygur elderly, this paper summarizes the key points of the design for the elderly. Then according to the design points, the Uygur flower hat visual elements innovation. Moreover, combined with modern intelligent applications, to carry out innovative digital design, and put forward new ideas for the future development of intelligent wearable and cultural integration suitable for the elderly.

Keywords- Uygur flower hat; Intelligent clothing suitable for the elderly; Cultural development; Digital innovation design practice

1 INTRODUCTION

1.1 Literature Review

For Uygurs flower hat research, should first focus on the content of the Xinjiang Uygur traditional pattern, etc. This type of work is: the "Xinjiang Uygur folk pattern" written by Jian wang, which focuses on the origin of the Uighur traditional pattern, and different forms of color and design represent the spirit of the connotation and symbolic significance. Secondly, studies the development of Uygur flower hat patterns from the perspective of history and religion. The book Ancient Buddhist Pattern Decoration Art in Xinjiang, China, compiled by Xiaobing Li, explores the symbolic religious significance of Uygur patterns. Finally, there's the artistic value of The Uygur flower hat. Abulaiti Mahesuti published Contrasts and Area Classifi Cation of Uygur Doppa. It mainly analyzes the Uygur flower hat's artistic characteristics and cultural significance from the aesthetic point of view.

To sum up, the author finds that current researches mainly study the pattern art of Xinjiang Uygur from a theoretical perspective. Still, few researchers can recreate traditional Uygur patterns with the new technology of scientific development in combination with modern value demands, lacking innovation of The Times. Therefore, this paper hopes to combine modern new technology to supplement the existing research and promote the inheritance, innovation and exploration of the traditional Uygur flower hat.

1.2 Current Status of Uygur flower hats

The most distinctive part of Uygur clothing is the flower hat. The flower hat is the characteristic of the Uygur headwear, both male and female; Uygur people have the custom of

wearing a flower hat. The selection of the hat is very sophisticated, exquisite technology, and the pattern of the hat is ever-changing. As a cultural achievement, Uygur flower hats are not only affected by the natural environment, geographical climate and other regional factors but also closely connected with social customs and religious beliefs. Different regions have different characteristics. Xinjiang, China, has a vast territory, mixed ethnic groups and different customs, so each region has its local characteristics.

In the 21st century, with the development of the economy and the opening of young people's minds, the traditional flower hats are more often worn by the elderly, who may have some functional needs. Therefore, the author hopes to extract some elements from the original flower hats for intelligent design.

2 ELEMENTAL ANALYSIS OF UYGUR FLOWER HATS

2.1 Analysis of Uygur flower hat pattern: Geometric patterns

In Islamic Pattern Design, the most basic is the circle, which embodies the Islamic thought of "Allah is one".¹ In the Uygur cultural concept, the circle means "sun", which means reunion. Circular grain generally with any point of the circle as the centre of the circle, continuous drawing circle to form a graph, can be made as a separate pattern can also form a full flower style. This circular pattern can be extended indefinitely. The fan, square and star formation are cut in the circle, according to the design of different shapes, to cover the whole plane. In the design of flower hats, circular patterns are usually matched with other patterns or are made into circular forms.

In The Uygur cultural concept, the triangle and rhombus represent the symbol of mountains and women. Rhombus is the result of connecting the vertices of a continuous circular pattern, that is, the combination of two triangles. In the design of the little flower hat, the triangle and rhombus are decorated with lace on the brim, or the design is segmented.

The grid pattern is an additional element of a pattern, which is mainly composed of regular quadrilateral and equilateral triangles to form the mesh system, which plays the role of reference positioning, and sometimes also serves as a decorative pattern. (Figure 1)

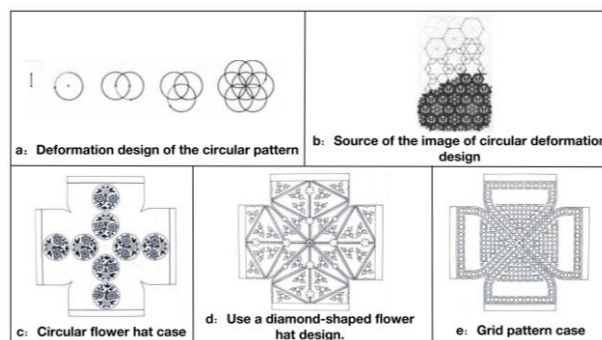


Figure 1: Deformation design of the circular pattern and Geometric patterns flower hat

¹ Doald Sutton, Islamic pattern design,2012.

2.2 Analysis of Uygur flower hat pattern: plant patterns

Xinjiang flower cap is mainly designed with plant patterns. The book "Xinjiang Flower Cap Design Art"² contains 250 samples, including flower caps of different embroidery methods in various regions of Xinjiang. Among them, 240 flower caps with plant patterns accounted for 96% of the total.

Xinjiang summer is short, with less rainfall dry climate. Winter is an extended, cold climate. Suitable for xi sun, cold-resistant, and resistant to early plant growth, so is the leading producer of roses, safflower and other plants in Xinjiang. Due to a long time under the influence of the culture of the central plains,³ pony patterns also became Uygur's design art. Therefore, Uygur patterns often use flower patterns such as rose and cockscomb patterns and peony patterns.

Melons and fruits from Xinjiang are not only essential trade products on the Silk Road but also a source of inspiration for Uygur handicrafts, among which the almonds, grape and pomegranate patterns are the most typical.

The most prestigious one is the Black-white flower hat with a pattern of Almonds. It is a kind of dried fruit that is rich in southern Xinjiang. This pattern symbolizes beauty, kindness, wisdom and love.⁴

The pomegranate originated in Persia. Symbolizing the "sacred tree of the sun"⁵, it has a symbol of abundance, and this symbol has been retained and inherited by the Uygur people. Most of these patterns are symmetrical in structure and have strong cohesion.

Grape is the most widely grown crop in Xinjiang. Late because of the limitation of the Uighur doctrine, Grape patterns appear in combination with flowers and fruits. (Figure 2)

² Hengde Zhang, and Lianfen Han, "Xinjiang flower hat design art" China, 2017.

³ Albreti Mahsuti, "Regional classification and comparison of Uygur flower hat" adorn. vol. 3. China, 2014, pp. 75-76.

⁴ Guangnian Shen, "Uygur flower hat and braid" cultural exchanges. vol. 10. China, 2012, pp. 62-65.

⁵ Chinese Artists Association, "Uygur folk handicrafts" 2014.













| | | | |
|--------------------|----------------------|---|--|
| The flower pattern | rose pattern |  |  |
| | Peony pattern |  |  |
| | Cockscomb pattern |  |  |
| Fruit pattern | Almonds pattern |  |  |
| | grape pattern |  |  |
| | pomegranate patterns |  |  |

Figure 2: The case of flowers and fruit

2.3 Color analysis of Uygur flower hat

Uygur people mostly use colours with high color purity and strong contrast. The most commonly used colours are white, black, green, blue, red and yellow. Meanwhile, contrasting colours and complementary colours are used to express patterns. Furthermore, the choice of these colours is closely related to their religious beliefs and living environment.

In small-cap color is used, the author extraction the book Xinjiang pattern art 226 samples of the color and pattern, sample on the choice of color, Xinjiang pattern art more inclined to black and blue, black accounts for 33% of all colours, blue accounts for 25%. The pattern color is primarily white, and the artistic effect of "white flower on black background" is presented in white pattern and black color. This time, it is the collocation of "red flower and green leaf". In the sample analysis, the red and green collocation and white in "red flower and green leaf" also account for 38%, and other colours are mostly decorative colours acting on the pattern color of the flower hat. (Figure 3)

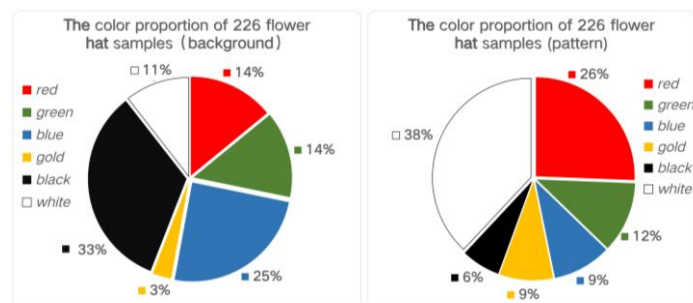


Figure 3: Color analysis of 226 flower hat samples

2.4 The influence of the Uygur flower hat on folk custom

Uygur scholar Abduxiukur Muhammad Imin said in *Public Aesthetics*, "Tradition is the continuation and deposition of a historical form, the combination of economic culture and religious customs of a nation and region, as well as the manifestation of aesthetic consciousness. Uygur flower hat art crystallises cultural charm and aesthetic wisdom in Xinjiang. Flower hat is not only daily articles but also the reproduction of folk culture. In addition to wearing hats, Uygurs also have the social custom of using flower hats to express their feelings. No matter the distinguished guests, relatives and friends come, they will send a flower hat to show their feelings.

3 SUITABLE FOR THE ELDERLY WEAR INTELLIGENT NEEDS

With the rapid promotion of AI technology, higher requirements are put forward for the intellectualization of elderly care.

First, in terms of security. Due to the constant weakening of the physiological function of the elderly, their protection and action force are constantly weakened, and they cannot face most of the safety problems in life, especially the elderly who live alone. They are likely to face more severe life safety problems. More advanced physiological parameter monitoring technology should be applied to intelligent wearable devices for the elderly to improve monitoring coverage and accuracy. Such as hats, clothes, shoes, and other clothing wear monitoring equipment and connected to a whole smart bracelet or mobile phone for centralized data analysis and management. Secondly, in terms of physiology, with the weakening of the self-care ability of the elderly, the elderly need more easy-to-operate, intelligent and close-to-life products. Finally, in terms of spirit, the products should have better portability and diversity, and the appearance should meet the aesthetic needs of the elderly to enhance their willingness to carry. To sum up, the intelligent products worn by the elderly Uygur must be clothes that are easy to operate, intelligent, and meet aesthetic needs.⁶

4 THE INTELLIGENT DESIGN OF THE UYGUR FLOWER HAT

4.1 The use of intelligent technology

In terms of the security of the elderly, for example, the On Star system is a perfect wireless service provided to users by wireless technology and global positioning system satellites. Can contact the customer service centre with only one key using CDMA network links and help customers solve problems through voice. The On Star system is generally used in the vehicle's rearview mirror, and the key is simple. Press the on key On the panel, and the system will connect to the On Star answering centre, which can get the needed help through the voice. In addition, the On Star system also includes positioning functions and audio navigation services. Unlike GPS navigation systems, it does not require a GPS display in the car, a memory for

⁶ Ren Dongming, Research on the demand old-age service, China,2022.

storing maps and a computer for calculating routes. Users can connect to On Star and tell the answering consultant the address. Then they can get the whole voice prompt, which provides convenience and speed for users. China Telecom CDMA network is also under construction and improvement. With the expansion of network coverage, the coverage of On Star will be further expanded in the future. (Figure 4)

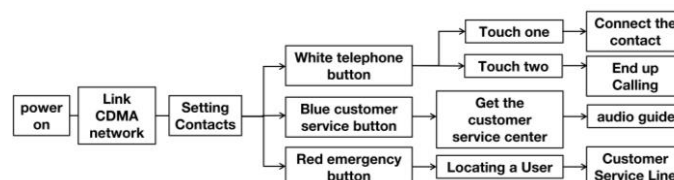


Figure 4: On Star system technology route

In terms of the physiological needs of the elderly, with the development of cloud computing, speech recognition, acoustics and other technologies, modern life is gradually equipped with voice services. Voice technology enables people to control smart devices through voice, such as intelligent speakers of various brands and mobile phone assistants, which facilitate people's lives. In 2011, Apple pioneered the use of Siri, an intelligent voice assistant, on the iPhone, allowing users to make calls, set alarms, play music and more. Subsequently, Chinese companies such as Xiaomi and Alibaba have also entered the field of voice interaction, and industries such as smart home and digital entertainment have also been developed. Voice interaction will bring new lifestyles and more application scenarios.

4.2 The application of digital technology in clothing

Clothing digitization can also be understood as the use of Internet technology and information technology to collect, integrate, process, calculate and analyze various data information of clothing in digital form. It needs to be emphasized that the data information form of clothing is not unique but diverse, such as text, pictures, and images.⁷

The virtual clothing model displays the effect of clothing design, and the information exchanged through three-dimensional and simulated human body models. CLO3D software is used to simulate the fabric performance, color and accessories of the sample clothing, and the characteristics of the clothing are shown as realistically as possible according to the process. Although the virtual fashion model can also three-dimensional display clothing design effects, the overall expressive force and appeal are far less than the actual fashion performance. (Figure 5)

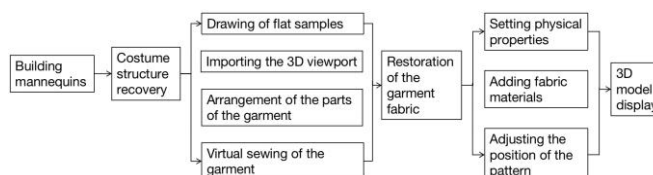


Figure 5: CLO3D modeling flowchart

⁷ Runji Jin, "Discuss the application of digital technology in fashion show," *The western leather.*, vol. 1. China, 2022, pp.55-56.

4.3 Design Element extraction

Flower hat extract classic square flower hat shape. The pattern adopts the Islamic circle drawing method (as shown in Figure 6) and the geometric division of circle and circle to make the flower hat. The decorative pattern of pomegranate pattern is used as decoration, highlighting the characteristics of national culture and national style, giving a deep impression. Make the design beautiful and simple.

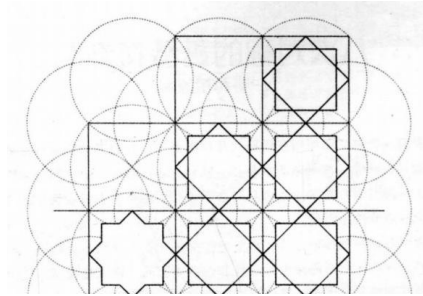


Figure 6: Islamic method of circle drawing

Uygur people mostly use pure colours with high hue saturation, bright hue and high brightness. Red is adopted as the primary color of the pomegranate pattern, and green is used as the contrast color to form the red-green matching effect in "safflower and green leaves". At the same time, using white as the base, the pomegranate grain in the white is a beautiful symbol.

4.4 Intelligent design model of flower hat

In the design, the "On Star system" is installed inside the flower cap. When the elderly walk outdoors, the simple and easy-to-operate keys are convenient for the elderly to use. A long press of the button will bring up an intelligent voice service similar to Siri. In case of danger, the user can connect to the "On Star System" response centre. Built-in positioning can provide coordinates for the elderly with "Alzheimer's disease", which is convenient for family members to find, and optimize the user's voice interaction experience in outdoor scenes.

In terms of appearance design, First, procreate was used to design the flower hat pattern and color (Figure 7), and then 3D design software Nomad was used for modeling. During modeling, the human body model is first established, and then the structure of the flower hat is restored. A new layer sample is created, and then the 3d window is imported, the physical properties of the flower hat are set, and the position of the pattern is adjusted. Install the ON STAR system in the flower hat. Finally, the shape of the finished flower hat under the 3D model is obtained. (Figure 8)



Figure 7: Flower hat pattern and color design

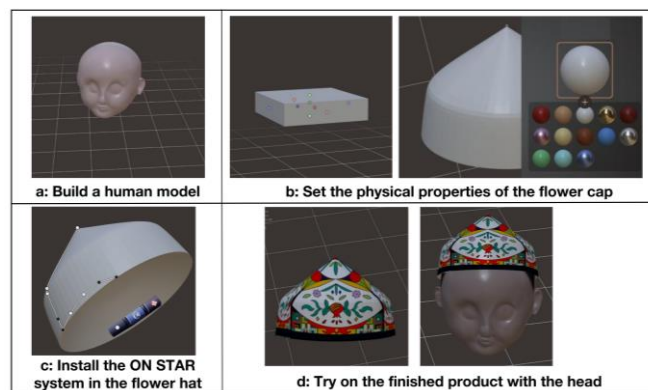


Figure 8: flower hat model design process and finished product

4.5 Summary

Uyghur flower hat has a unique artistic style and cultural connotation. The local people's geographical environment, religious consciousness, aesthetic orientation and social customs of splendid culture reflecting the Uyghurs and the inheritance of the tradition of art style embodied in their design are based in-plant patterns for decoration, the primary base colours with white, red, and green. Modeling is beautiful, Practical robust. However, national art needs innovation and development not to be eliminated by the market. Therefore, combining new science and technology to develop minority art is the general trend of The Times and the future of national development.

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