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THE EMBODIMENT OF TRADITIONAL NATIONAL CULTURE IN MODERN FOOTWEAR DESIGN

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This paper discusses the embodiment and innovation of traditional national culture in modern footwear design. This paper analyzes the application of traditional national cultural elements such as pattern, color and material in modern footwear design, and studies the digital embodiment of pattern, software integration technology, search and edit function and 3D modeling realization in modern footwear software operation flow. The research aims to provide new ideas for the protection and inheritance of traditional national culture, and inject new vitality into the innovation and development of modern footwear design.

Key words: national culture, modern footwear design, software operation, cultural inheritance.

INTRODUCTION

In the tide of globalization and modernization, traditional national culture, as a bright pearl in the long river of human history, is facing the urgent task of protection and inheritance. These cultures not only contain rich historical deposits and unique artistic values, but also an important part of the national identity and spiritual home [1]. In the field of modern footwear design, the integration of traditional national culture elements is not only a tribute to traditional culture and inheritance, but also an important way to design innovation. The elements of pattern, color and material in traditional national culture, with their unique charm and profound symbolic significance, provide a rich source of inspiration for modern footwear design [2].

However, how to maintain the essence of traditional culture while integrating with modern aesthetic trends and design concepts has become a problem worth pondering. The intelligence and convenience of the operation process of modern footwear design software make this integration possible. Through the digital pattern library, intelligent search and editing functions in the software, designers can easily obtain and apply traditional cultural elements, realize the seamless connection between traditional culture and modern design, help consumers better understand and appreciate the cultural connotation of products, enhance the cultural identity and market competitiveness of products, and provide designers with accurate

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design guidance. Promote the development of personalized customization and intelligent production [3].

PURPOSE

This study aims to deeply explore the embodiment and innovation of traditional national culture in modern footwear design, hoping to provide new ideas and methods for the protection and inheritance of traditional national culture, and inject new vitality into the innovation and development of modern footwear design.

RESULTS AND DISCUSSION

Traditional national culture is a cultural system with distinct regional and national characteristics formed in the course of a nation's long-term historical development. It covers language, writing, art, religion, customs, festivals, clothing, architecture, handicrafts and other aspects, and is an important symbol of a national identity [4]. The pattern, color, material and other elements in traditional national culture not only show the unique aesthetic concept and life style of each nation, but also carry profound cultural significance and symbolic value. These elements not only have aesthetic value, but also reflect the national spirit, and are a bridge between the past and the future. In footwear design, the application of traditional national culture is particularly significant. Different nationalities have different styles of shoes, from the choice of materials to the design of patterns, which reflects the pursuit of beauty and understanding of life of all nationalities [5]. For example, China's embroidered shoes, India's jewel-decorated shoes, Africa's woven shoes, etc., are all examples of the perfect combination of traditional national culture and modern footwear design, see Fig.1 – Fig. 3. These designs not only show the practical function of shoes, but also convey the historical story and cultural connotation of the nation through unique cultural elements.

Fig. 1. Embroidered shoes, Xia Xu, China, 2024

Fig. 2. Jewel-decorated shoes, Imran Khan, India, 2022

Fig. 3. Woven shoes, Amariam Gebre, South Africa, 2023

With the advancement of science and technology and the diversification of consumer demand, modern footwear design is undergoing a transformation from traditional to modern. On the one hand, the application of digital and intelligent technology makes footwear design more accurate and efficient; On the other hand, the rise of personalized and customized services has also promoted the innovation and development of footwear design.

In the field of modern footwear design, the use of pattern is not only the combination of traditional aesthetics and modern technology, but also an important means of designers' creative expression. With the progress of science and

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technology, especially the rapid development of digital technology, the way of embossing and drawing patterns in the design process has undergone revolutionary changes. Modern footwear software not only provides a rich pattern library and powerful editing tools, but also integrates 3D modeling technology, making the pattern design more flexible and diversified, to meet the personalized and customized market needs. The following will deeply explore the digital embodiment of pattern in the operation process of modern footwear software, software integration technology, search and editing function, drawing practice and 3D modeling realization, and show the whole process of pattern design from conception to realization through specific case analysis.
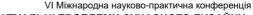
The digitalization of pattern is the cornerstone of modern footwear design. The process involves transforming traditional hand-drawn patterns, natural patterns, or creative ideas from a designer's mind into a digital format that can be recognized by a computer. Digital pattern is not only easy to store, transfer and share, but more importantly, it can be seamlessly integrated with various design software to achieve efficient editing and application. Modern footwear design software such as Adobe Illustrator, Photoshop, SketchUp, as well as software designed for the footwear industry such as Shoemaster, LeatherWorks, etc., all support importing and editing digital pattern, see Fig.4 – Fig.5. These software provide designers with a powerful pattern processing platform through built-in vector drawing tools, image processing algorithms and database management systems. Through integration technology, designers can easily invoke, adjust and apply patterns in design software, greatly improving design efficiency and flexibility.

Fig. 4. Ethnic pattern upper surface redesign, Zhang Yuan, China, 2024

Fig. 5. Redesign traditional patterns with SketchUp, Liu Xin Jie, China, 2025

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In order to efficiently manage and utilize a large number of digital patterns, modern footwear software is usually equipped with a powerful pattern library system. These pattern libraries not only contain various styles of patterns, such as ethnic styles, geometric abstractions, natural elements, etc., but also support user-defined upload and classification management. Designers can quickly retrieve suitable patterns for application according to project requirements. The management functions of the pattern library include category browsing, label search, preview amplification, favorites management, etc., so that designers can quickly locate the required patterns, while keeping the work space clean and orderly. In addition, some advanced software supports cloud synchronization of pattern libraries, allowing designers to seamlessly switch between devices and create anytime, anywhere.

In modern footwear software, the search, editing and application of pattern is one of its core functions. Designers can quickly search for satisfactory patterns by keyword, color, style and other conditions. The editing function covers scaling, rotation, mirroring, color replacement, transparency adjustment, etc., allowing designers to flexibly adjust patterns to suit different design needs. The application function is more extensive, including the direct application of the pattern to the upper, sole, shoelace and other parts, as well as the texture mapping technology to integrate the pattern into the 3D shoe mold, see Fig.6. Some software also supports the simulation combination of pattern and shoe material, helping designers preview the effect of pattern under different materials, so as to make more accurate design decisions.

Fig. 6. Map ethnic pattern vector images to 3D models, Zhang Xiao Fei, China, 2024

CONCLUSION

With the popularity of 3D printing technology, modern footwear software has also begun to integrate 3D modeling functions, making the pattern design not only stay on the two-dimensional plane, but can truly realize the three-dimensional

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display of three-dimensional space. Through 3D modeling, designers can create a three-dimensional model of the shoe and incorporate the pattern in the way of texture mapping or geometric engraving to simulate the real sense of material and light and shadow effects. 3D modeling software such as Blender, SolidWorks, and Shoes Creator, designed for the footwear industry, provide a wealth of modeling tools and material editors that allow designers to easily implement complex shoe shapes and patterns. At the same time, these software also supports the export of 3D printing formats such as STL and OBJ, which is convenient for subsequent production and processing.

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ЦЯН Вей, ПАШКЕВИЧ К.
ВТІЛЕННЯ ТРАДИЦІЙНОЇ НАЦІОНАЛЬНОЇ КУЛЬТУРИ У ДИЗАЙНІ СУЧАСНОГО ВЗУТТЯ

У роботі проаналізовано застосування традиційних національних культурних елементів, таких як візерунок, колір і матеріал, у сучасному дизайні взуття, а також розглянуто цифрове втілення малюнка, технології інтеграції програмного забезпечення, функції пошуку та редагування, а також реалізація 3D-моделювання в процесі роботи сучасного програмного забезпечення для проєктування взуття.

Ключові слова: національна культура, сучасний дизайн взуття, функціонування програмного забезпечення, культурна спадщина.