

Simulation Design of Traditional Costumes Based on Digital Printing Technology

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Abstract

This paper deals with the research on simulation design of traditional Chinese costumes in digital method. We take Chi-pao (Cheongsam), the Mandarin gown of the Qing Dynasty as the research object and conduct a comprehensive analysis of its structures, colors, patterns and other traditional crafts. Then a simulation digital design is made and cutting pieces are printed through digital printer. The finished product shows that the simulation of traditional costumes through this method is feasible to achieve satisfactory results. Thus, simulation design can be used as one of the ways to research, inherit and spread the traditional Chinese costumes.

Keywords: Simulation Design; Traditional Costumes; Garment CAD; Digital Printing; Embroidery

1 Introduction

After thousands of years of development, Chinese costumes have within itself rich meanings, and have become a source of inspiration for many designers. Digital technology provides a new method for the research on and inheritance of traditional costumes, with fruitful research results. Research on traditional costumes with digital technology is mainly on the following aspects: First, using digital technology for academic classification, information storage and the building of multimedia information database of the traditional costumes [1, 2]; Second, using multimedia virtual scene modeling, multimedia virtual scene display, to demonstrate three-dimensional, full touch interactive costume models, to facilitate a more perceptual, in-depth understanding of traditional costumes [3-5]; Third, developing computer-aided traditional costume design systems so as the classified display and interactive design of traditional costumes are made possible [6].

This paper deals with the research on simulation design of traditional Chinese costumes in digital method. A comprehensive analysis of Chi-pao in its structures, colors, patterns and other traditional crafts are conducted and a simulation digital design is made accordingly, through which cutting pieces are printed through digital printer. The finished product is verified as identical to the original one. Simulation products can be worn, in any environment or conditions. The

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practicalities of this method is that it significantly reduces the cost and the production time, so that the finished products, such as souvenirs, tourism products, costumes can be launched.

The significance of this paper goes beyond the study, inheritance and spread of traditional Chinese costumes, to that of other forms of traditional Chinese culture.

2 Chinese Traditional Costume Analysis

Chinese costume culture varies from dynasty to dynasty. Basically, each dynasty has its own costume system and its specific protocol requests. Qing Dynasty marks the most stylish time in Chinese history. The Qing costume not only shows a high degree of craftsmanship in clothing, but also reflects China's long cultural tradition and the remarkable achievements of Chinese art [7].

The simulated work copies the Polychrome Embroidered Manchurian Gown of the late Qing Dynasty, collected at the China National Silk Museum [8]. The length of the dress is 138 cm and its width is 124 cm, as shown in Fig. 1. Chi-pao, also known as cheongsam, has evolved from the Manchurian gown worn by Manchu women in the Qing Dynasty (1644-1911) [9].

Outline structure: The overall contour of the Chi-pao is straight and loose, with a feature of a large front lapel opening to the right (i.e. with buttons on the right side) and Mandarin collar. The hem reaches the ankle. There is a slit on each side that goes all the way from the hem to the armpit. The sleeve cuffs and main part of the gown form an integral whole. An extended section at the cuff reveals a distinctive feature of woman's costumes of the Qing Dynasty.

Color patterns: Prominent on this dress is a full-length flowering hibiscus embroidered on red silk fabric. Colorized embroidery patterns of the "Butterfly Loving the Flower" are also added on the sleeve cuffs, symbolizing the beauty of love. The mushroom-shaped Ruyi pattern, as a symbol of good luck, expands outward from the straight line of the edging to form a flowing arc end at the armpit.

Edge: Black silk borders are used for the collar, along the front panel, or around hemline and cuffs, part of which are also embroidered. Woven laces are used for outlining the whole shape. This piece of garment is complicated, but of exquisite beauty.

3 Digital Simulation Design

The simulation design is of three steps: pattern drafting of the gown, simulation design of color patterns and edging process, and layout design of cutting pieces. The digital simulation of embroidery color patterns is the key to the whole process.

3.1 Pattern Drafting

Size: The picture image provides only two sizes: a length of 138 cm and a width of 124 cm which is far from enough; therefore, the size of each part needs to be calculated proportionally by two known sizes according to the tiled dress. The flat-cross pattern is used in traditional Chinese clothing to ensure the best utilization of fabric. It means the front, back, and sleeves are all in one piece, so the outline of flat pattern forms a cross-shape [9]. An 1: 1 model is drawn according