iMake : Computer-aided Eye Makeup

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Figure 1. Example of artistic eye makeup.

ABSTRACT

Many women enjoy applying makeup. Eye makeup is especially important for face makeup, because eyeshadow color and eye line shape can dramatically change a person's impression given to others. In addition to standard eye makeup, there is "artistic eye makeup," which tends to have a greater variety of designs and is more ostentatious than standard eye makeup. Artistic eye makeup often has a motif of characters or symbols, such as a butterfly or a musical note. Needless to say, it is often difficult for non-artistic people to apply this type of eye makeup. Artistic eye makeup requires a special technique; therefore, we propose and implement a computer-aided eye makeup design system called "iMake." This system generates eye makeup designs from the colors and shapes of a favorite characters selected by a user. Once the user has selected the desired eye makeup pattern, an ink-jet color printer prints it on a transfer sheet that the user can apply to his/her eyelids. The user can design any type of eye makeup with a simple operation, and then apply the transfer sheet makeup without any special techniques.

Author Keywords

Eye makeup; Image processing; Transfer sheet; Augmented Fashion.

ACM Classification Keywords

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General Terms

Design;

INTRODUCTION

Makeup forms part of an individual's personal appearance, and many women enjoy applying makeup. In addition, it is no longer uncommon to see some men apply makeup as well. In particular, eye makeup is one of the most effective makeup methods, because it is possible to easily change a person's expression and the impression given to others by changing the eyeshadow color or eyeline shape. With this in mind, we have implemented a system to support eye makeup.

For ordinary eye makeup, people use eyeshadow colors, create gradation on eyelids, and draw an eye line using an eyeliner. Finally, the individual uses an eyelash curler and applies mascara or false eyelashes. This is the standard makeup method.

Conversely, designable and ostentatious eye makeup also exists. Many of these have game, anime, or comic character motifs, or attractive symbols such as a butterfly or a musical note. This type of eye makeup is called "artistic eye makeup" (see Fig. 1 for examples). Artistic eye makeup involves the use of many eyeshadow colors and brilliant design drawings using an eyeliner.

Obviously, it is difficult for non-professionals to apply such eye makeup. In general, artistic eye makeup is applied by professional makeup artists who have experience with special techniques. Ordinary people must ask professionals for help in applying artistic eye makeup, because many people usually experience considerable difficulty even when drawing simple eyelines required for standard makeup. Artistic eye makeup requires many eyeshadow colors that average women do not possess: most women have just two or three different groups of colors. For example, although a red eyeshadow is not used in standard eye makeup and most people do not have it, it is often used in artistic eye makeup. Once our eye makeup application becomes available, it can help make complex artistic eye makeup easy, thus supporting daily standard eye makeup. The application would be widely accepted and modify our makeup methods.

In this paper, we describe a computer application called "iMake" that provides designable eye makeup opportunities for non-artistic individuals.

RELATED WORK

Many studies have been performed in order to assist or simulate makeup. For example, Liu et al. [2] and Wang et al. [4] have developed systems utilizing face
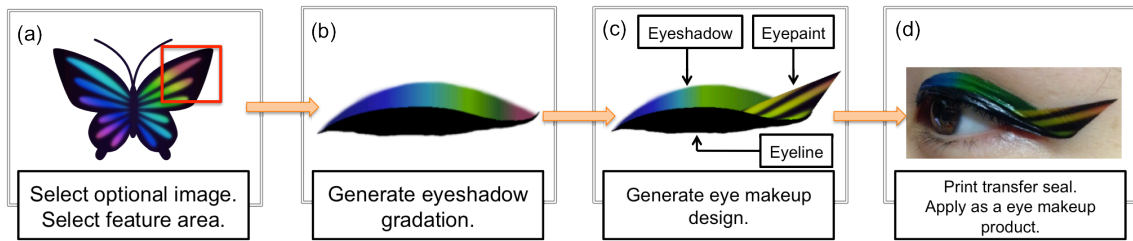
Figure 2. iMake makeup workflow.

recognition techniques that simulate makeup based on the user's face. Scherbaum et al. [3] have developed a based makeup simulator that proposes the best makeup method for a given user.

Facial makeup for special situations, such as theater drama, has also been studied. There is a makeup design support system for the Peking opera [1].

These studies have proposed technical improvements for makeup application using simulations. In this paper, we propose a novel makeup method supported by a computer application. By using this system and printing the results on a transfer sheet, it is possible for a user to apply better eye makeup easily, without requiring great skill or expertise, or any cosmetic products.

SYSTEM OVERVIEW

iMake is a computer application that generates eye makeup designs from the colors and shapes of images provided by users. Subsequently, users can apply their designs to their eyelids after printing the design on transfer sheets.

Fig. 2 shows the system's makeup-design workflow. iMake utilizes an image provided by a user (see Fig. 2 (a)). The user can select any desired image. In the first step, the user selects a feature area (see Fig. 2 (a)) that will be especially reflected in the following eye makeup design steps. In the artistic eye makeup design process that features characteristic images, a technique or design sense that reflects image features is required. In our system, the design process is semi-automatic; the manual process merely involves the user selecting a feature area within the image. iMake creates the eyeshadow's gradation (see Fig. 2 (b)) and reflects the feature area on the final design (Fig. 2 (c)).

We organize the eye makeup design into three elements to simplify the design generation: "Eyeshadow," "Eyeline," and "Eyepaint," as shown in Fig. 2 (c). "Eyeshadow" and "eyeline" are common terms used in eye makeup. Conversely, "eyepaint" is a term defined in this paper to indicate the iconic part of the design. The current prototype, the shape of the eyepaint is fixed.

Once the eye makeup design is complete, the user can print it on a transfer sheet and apply it to the eyelideyelids (Fig. 2 (d)).

We implement this system by using OpenCV, OpenGL, C++.

Figure 3. Comparison of eye makeup using a transfer sheet (left), and standard makeup (right).

TRANSFER SHEETS

The transfer sheets that the iMake system uses are similar to the fake tattoos applied by adhering them to the human body. The user cuts around the image. Then, the user places the transfer sheet on the desired spot and presses a wet cloth or paper towel in order to adhere the image to the skin. We compared the transfer sheet method with the conventional eye makeup method to evaluate the feasibility of applying transfer sheets for eye makeup. As shown in Fig. 3, transfer sheets display a more vivid eyeshadow color and are applicable to eye makeup. Eye lines also look natural. From these results, we think transfer sheets are sufficiently feasible for use in the eye makeup process.

CONCLUSIONS

We have created a prototype of the iMake system based on a method for generating eye makeup designs from an image selected by the user.

In future work, we will improve and enhance the following functions: (1)Create functions of editing eyepaint shape. (2)Monotone or grayscale image support. (3)Support for a variety of eyeline shapes. (4)Deployment to applications and services on the Web.

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