

Facial Feature Exaggeration System for Caricature Generation

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I. INTRODUCTION

Facial caricature is an art form that exaggerates the feature of a person. Caricatures are commonly used as ways to convey humor and sarcasm, as gifts, souvenirs and social networking avatars.

CariGAN [1] is a caricature generation method. In CariGAN, caricature generation is divided into two tasks—photographic style transformation and feature exaggeration—which are implemented by the generative adversarial network.

In this paper, we propose a facial feature detection and exaggeration system that can be flexibly adjusted by the user.

II. METHOD

The proposed system detects facial landmarks from the input of a photographed image, and then detects and exaggerates the features from the facial landmarks. In addition, the output can be adjusted by the user with parameters for each facial feature.

A. Detect Facial Landmarks

Facemesh [2] is used to detect facial landmarks. Facemesh is a fast and small package that can detect 3D facial shapes from images.

B. Type of Facial Features

Facial features are detected by using the difference from the mean face. In addition, landmarks are classified into face parts—eyes, nose, mouth, eyebrows, and silhouettes. In this study, we detect the following three types of facial features.

1) *Placement*: A feature that relates to the translation between face parts. The feature is detected by taking the center points of the face parts and checking the positional relationship between the center points. It exaggerates by translating all the landmarks in the face parts.

2) *Shape*: A feature that represents the shape of the face parts. It detects the difference from the mean face for each landmark as a position vector. The feature is an array, and the length of the array is the number of landmarks.

3) *Angle and Size*: A feature of the linear transformation of face parts. It prepares functions to get the angle and size of each part and detects the features based on difference from the mean face.

III. RESULTS

Figure 1 shows an example of exaggerating a slanted eye using the proposed system. It is difficult to recognize the features of the input image compared to the mean face, as shown in Figs. 1(a)-(c). However, by exaggerating the shape and angle, we can recognize that the input image is a slanted eye, as shown in Figs. 1 (d)-(f).

The features are exaggerated by multiplying the difference from the mean face by a parameter. The system automatically exaggerates features, but users can flexibly adjust for each type of feature.

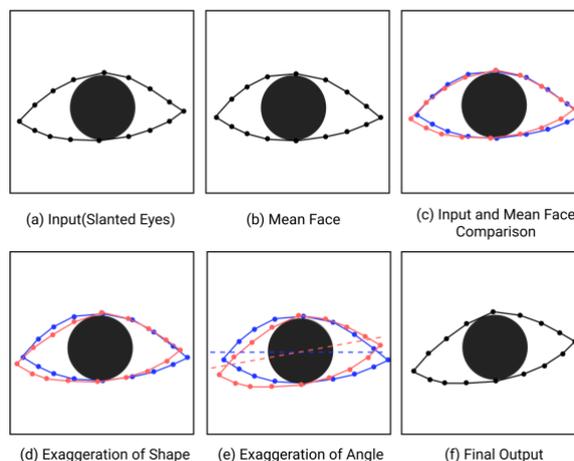


Fig. 1. Exaggerated slanted eyes example of our system. Blue represents the mean face landmark and red represents the input landmark.

IV. CONCLUSION AND FUTURE WORK

In this paper, we focused on the task of facial feature exaggeration in caricature generation and proposed a system for facial feature detection and exaggeration that can be adjusted by the user.

In addition to improving this system, we will integrate this system with a photo artistic style transformation for caricature generation.

REFERENCES

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