Proposal of face parts morphing and interactive interface to support cartoon generation

KOMATSU Akiko

This thesis presents an interactive face cartoon generation system that visualizes the characteristics of the subject and the differences between the cartoons.

In various situations such as SNS and games, there are increasing opportunities for face cartoon avatars and icons to be used as a means of expressing the impression of a person. With face cartoons becoming more familiar in this way, there is an increasing demand not only for enjoying watching cartoons, but also for creating face cartoons and using them in SNS, games, and video content. When using a cartoon as an avatar, it is not always important that the cartoon resembles the subject in a realistic sense. Rather, it is sufficient to create a cartoon that captures the characteristics of the subject so that even an acquainted person can recognize who the subject is.

As a method of electronically creating such a cartoon, user manually selects the one that seems to capture the characteristics of the subject's part from multiple illustration images for each facial part such as eyes and mouth, and the system combines these is widely used commercially. In such a system, the more parts illustrations are prepared, the more various cartoons can be created, but finding the parts that efficiently capture the characteristics of the subject from the huge number of parts illustrations becomes difficult. In particular, when creating a face cartoon from multiple subjects with similar characteristics, it is not easy to capture the characteristics of each subject and express the differences between the subjects. In addition, there is a problem that it is necessary to spend a lot of time and cost to prepare a large number of illustration parts.

In this paper, we focus on not only whether the face cartoon captures the characteristics of the subject as a single, but also the relative expression compared to the cartoon of others. We propose an interactive face cartoon generation system that visualizes the differences between the cartoons and recommends cartoon parameters that can effectively express differences with others. As a result, the user can relatively grasp the difference in the characteristics of each cartoon, and can create a cartoon that captures the characteristics of the subject.

This system firstly generates an initial cartoon for a single subject by automating the selection of part illustrations that capture the characteristics of the subject. The system applies morphing technology to the parts illustration image with weights based on the characteristics of the subject's face and synthesizing the parts illustration images. This procedure can generate a cartoon that capture the detailed characteristics of the subject. In addition, our system provides an interactive interface to support the subjective judgment of the user to express not only whether the cartoon captures the features but also the features that can be distinguished from others. The system interface displays multiple face cartoons on the screen and visualizes the similarity distribution of cartoons that are calculated based on the parameters of each part.

Also, our system proposes the user with effective parameters to express the difference from other cartoons based on the results of a questionnaire regarding the impression given by each part of the

cartoon (such as eyes and eyebrows). This allows the user to adjust the face cartoon parameters to get closer to the cartoon that they feel is similar to the subject while checking which other cartoons they are currently working on are similar or different. As a result, this system supports the task of creating cartoons that capture the subject-specific features not found in other cartoons, while avoiding creating cartoons that are very similar to other cartoons.