Proposal of Avatar Generation System based on design according to generation of comic character

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Abstract—Character design of animation and comic has been sensitively reflects the fashion of the era. For example, in the 1970s, when mini skirt is prevalent in society, there were many characters of comics that had been serialized in that time wear a mini skirt. In this research, I investigated features of the comics which were popular in each generation to the 2000s from the 1960s in Japan, and analyzed the correlation between them and fashion or design which were popular at that generation. Based on the results of research and analysis, I suggested the entertainment applications that generate an avatar that reflects the age and generation. When users make an Avatar by choosing the fashion and hairstyle of choice, it determines whether the user’s sense is closer to which generation.

I. INTRODUCTION

Character design of animation and comic has been sensitively reflects the fashion of the era. In this research, I investigated features of the comics which were popular in each generation to the 2000s from the 1960s in Japan, and analyzed the correlation between them and fashion or design which were popular at that generation. Based on the results of research and analysis, I suggested the entertainment applications that when users make an Avatar by choosing the fashion and hairstyle of choice, it determines whether the user’s sense is closer to which generation.


In this research, at first, I investigated the design structure of the character of the popular comics in Japan to the 2000s from the 1960s. From there, I classified the shape of the part of the character, and compared percentage of body proportion and the human anatomy with real people by generation.

A. Case 1: Character structure of popular comics of the 1980s

I will show below the design structure of the character of popular comics of the 1980s.

B. Case 2: Design structure of the comic characters of five years

I will show below the design structure of the comic characters in the recent five years from 2013.
Many comic characters have features which they are 7.5 or more heads tall. It is higher than the real people. In addition, there is a tendency that the foot is long. In the 1980s, the eyes were drawn extremely large, but recently, comic characters that size of the eye is drawn close to the structure of real people have appeared.

(Figure 3 Ratio of eye and face of Japanese popular comic characters of the past five years)

(Figure 4 Head and body and physique of Japanese popular comic characters of the past five years)

III. CASE 3: DESIGN STRUCTURES OF “MAJOKKO” SERIES

A. Features of character design of Majokko series

“Majokko (magical girl = mahō shōjo)” animation series is Girl’s animation series that produced in Japan in the 1960s and follow to today. Even outside of Japan, they are viewed widely and has produced a number of similar various works. The magical girl (mahō shōjo) series reflects greatly girl’s fashion in many cases. Characters of magical girl (mahō shōjo) series are drawn in a lowered head and body than real people. They are almost from 4.5 to 6.2 heads tall. Eye is extremely larger than the characters of comics for boys. That is, the eye occupies more than one-seventh of the face in many cases. In addition, there are tendency that the width of the eye are narrower than the characters of comics for boys, and the position of the eye is placed lower.

B. Correlation of the epidemic in the real world and comic characters design

By comparing magical girl (mahō shōjo) animation aired and the female idol that was in vogue at that time, I found that they are largely approximate. For example, in magical girl (mahō shōjo) anime of the 1970s, many of the characters wear mini skirt. Socially, in the 1970s, miniskirt was boom. Also, even if I look magic girl (magical girl = mahō shōjo) anime in recent years, I found a common point that group. For example, there are heroine of more than one person in “Magical Girl Madoka☆Magika” was popular in the 2011 and Idol which was popular in those days was the group named AKB48. I considered Majokko series is strongly influenced by idle at the time.

(Figure 5 The ratio of the face and eye of “Majokko” series)

(Figure 6 Body and head and physique of Majokko series)

IV. AVATAR GENERATION SYSTEM BASED ON CLASSIFICATION OF EPIDEMIC ANIMATION ACCORDING TO GENERATION

A. Abstract of System

I will show below an abstract of the smart phone application that I propose in this research. By selecting a body part of a design symbolizing the comic and anime which are popular in the age and generation stored in the application, you combine and produce an avatar original. Further, the tendency of the generation of the selection part of the avatar generated avatar you have produced is determined “whether the sense which generation ” generally. Choice is 12 the following items.

①Shape of eye  ②Size of eye  ③Shape of eyebrows
④Shape of nose  ⑤Shape of mouth
⑥Size of mouth  ⑦Hairstyle
⑧Shape of face and outline  ⑨Scale of head and body
⑩Clothes  ⑪Shoes  ⑫Other, accessories
The determination result have six patterns, that is, 1960s, 1970s, 1980s, 1990s, 2000s, and all age type from generation trend of the selected part.

B. Development environment

Development environment is Xcode (Version 5.0.1) of Mac OS (10.8.5). I used the Objective-C and developed as for iOS application. It uses the iOS SDK 7.0 and runs on iOS7.0. Because it is the application that diagnoses from the chosen alternative and generates avatar, I created a program to reflect on the next page the selected image, and point to be added to a particular category by the selected image. At the end, it has the sum of the points that have been added and calculates how much each category accounts for the total, and display them.

C. Execution example of the application

I will show below an example of executing the application proposed in this thesis.

1) Selection of the shape of the eye: First, you decide the shape of the eye. Form of a specific to age has not been found at this stage in the form of the eye itself, it is assumed that a point is not added in any generation at the stage of the selected shape of the eye. However, Application does the process of reflecting the image of the eye chosen in the next screen.

2) Selection of the size of the eye: Then you decide the size of the eye. Select what pieces of the size of the eye are equal to a vertical length of the face at this stage. There are five choices, which are 5 to 1, 6 to 1, 7 to 1, 8 to 1, 9 to 1. 8 to 1 is selected in the following example so that 100 points are added to the 2000's. Process of switching an image of the eye in the moment to adjust the size, and processing to the next screen by pressing the ENTER button is done.

3) Selection of the shape of the eyebrow: Then you decide eyebrows. Choice is five elongated eyebrow, thin and long eyebrows, thin and short eyebrows, thick and thin eyebrows, no eyebrows. Form of a specific to age has not been found at this stage in the form of the eyebrows themselves, it is assumed that a point is not added in any generation at the stage of the selected eyebrows. Process of reflecting the image of the eyebrows chosen in the next screen is done.

4) Selection of the shape of the nose: Then you decide the nose. Choice is a four, which are point nose, vertical line nose, horizontal line nose, key nose. Form of a specific to age has not been found at this stage in the form of the nose itself, it is assumed that a point is not added in any generation at the stage of the selected shape of the nose. Application does the process of reflecting the image of the nose chosen in the next screen.
5) **Selection of the shape of the mouth:** Then you decide the shape of the mouth. Choice is a four reverse triangular, linear, point type, the semi-circular. Form of a specific to age has not been found at this stage in the form of the mouth itself, it is assumed that a point is not added in any generation at the stage of the selected shape of the mouth. Process of reflecting the image of the mouth chosen in the next screen is done.

6) **Selection of the size of the mouth:** You decide the size of the mouth. The choices are three stages, which are large, medium and small. Size of a specific to age has not been found at this stage in the size of the mouth itself, it is assumed that a point is not added in any generation at the stage of the selected size of the mouth. Application does the process of switching an image of the mouth in the moment to adjust the size, and processing to the next screen by pressing the ENTER button.

7) **Selection of hairstyle:** Then you decide the hair. Based on the survey results, choices were prepared parts of hairstyle was popular in the 2000s-1960s. In the following example, because a princess cut has been selected, 100 points are added to the 1970s. Basically, 100 points are added to ages hairstyle you chose is very popular, but the 10000 point is added to the Edo era type if you select choice of jokes, a topknot. Also process of reflecting the image of the mouth chosen in the next screen is done.

8) **Selection of head and body:** You decide to head and body. Choices and four stage, which are 5 heads tall, 6 heads tall, 7 heads tall, 8 heads tall. In the following example, because 7 heads tall has been selected, 25 points are added to the 1990s and 25 points are added to the 1970s and 50 points are added to the 2000s. Because it is the size adjustment, the process of switching an image of the head and body in the moment to adjust the size, and processing to the next screen by pressing the ENTER button is done.

9) **Selection of clothes:** You decide the clothes. Providing part of clothes that were popular to the 2000s from the 1960s, 100 points are added to the age clothes you chose was very popular. Points are added to the 2000's in the following example. Also process of reflecting the image of the mouth chosen in the next screen is done.

10) **Selection of shoes:** You decide the shoes. Similar to the stage you choose the clothes and hairstyle at step 7 and 9, providing part of the shoes that was popular in the 2000s to 1960s, points are added to the age of the shoes you have chosen is very popular choice. It is assumed that the 50 point addition here. However, some are likely to be worn in all ages, such as sneakers, it is assumed that 10 points is incremented by each age if you select it. Also process of reflecting the image of the mouth chosen in the next screen is done. Platform boot is selected in the following example, points are added to the 1970's.
11) **Selection of accessories:** You choose the other accessories, which are Hat, glasses, and earrings. Similar to step 7, 9 and 10, points are added to the ages accessories you chose was very popular. 30 points are added here. And process of reflecting the image of the mouth chosen in the next screen is done.

12) **Generation of avatar and generation decision:** You press the diagnostic button, total the points that have been added by the option you selected in each step, and calculate what percentage of the total each category to the 2000s from the 1960s occupy, and display them. Then, it is determined to be the age of aesthetics of your age accounted for 60% or more. It determined that half of two age when two age accounted by 50%. It determined that all age types, when each age was less than 30%.

V. **CHALLENGES FOR THE FUTURE**

In this research, I have developed a generational avatar generation application based on the character design of comics and animations that were popular in Japan to the 2000s from the 1960s.

Although Comics and anime in Japan are prevalent worldwide and accepted, in principle, as a general rule, the subject of this application is limited to Japanese. In the future, I want to aim for applications targeted as well as comics and animation outside of Japan.

**REFERENCES**

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