ORIGINAL CONTRIBUTION
Implementation of Font Change Application for SNS by Image Selection

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Abstract— This paper proposes a new function, which changes fonts by selecting visual expressions of emotions. We have used different fonts for emotional expressions when creating documents. We know that emotional expressiveness can be improved spectacularly by using different fonts. Therefore, we developed a front-end application with a font adjustment function for SNS, premised on using plain texts. If the user selects an illustration of a certain emotion that he or she wants to add to the texts, the "font" of the text will be changed into the one that fits the selected emotion. Normally, the images are selected by typing characters. However, this application can change the characters of the texts based on the selected images and realize more intuitive character expression. Today, when creating some documents, considering fonts is a usual practice. It is clear that fonts give texts emotional meanings. By using this application, the emotional meaning provided by the font can be added to the characters. In short, the characters become the texts that can reach another person more accurately. It is possible to express a wide variety of emotions, and more smooth communication by texts can be expected. We propose the app that the user can attach their emotion to the text by font change function. This app will be expected to give us smooth communication by texts .

Index Terms— IT Introduction, Smartphone Application, Font, Social Networking Sites, Messenger Software, SNS Communication, Emotion

I. INTRODUCTION

There are three forms in communication of human society.
1. Face-to-face
2. Voice only
3. Text only

In "Face-to-face" communication, we can see the other person's expression. We judge his or her emotion by facial expression and choose words. Then, we transmit information by making pauses, changing the voice tone, and making eye contacts as needed. The other person also sees our expressions and understands the words.

Then, judging our vice tones, he or she surmise intentions of the received information. In "Voice only" communication by telephone, the expressiveness is slightly degraded because the partner's facial representations are invisible. However, the voice tones can be changed freely. From the voice tones, the emotions of the other person can be surmised.

What we need to consider is "Text only" communication. "Text only" communication became essential for our daily lives because of the widespread use of the computers and the Internet. The culture that began with the appearance of emails is prevailing rapidly nowadays.

The cause is the popularization of SNS. Today, the number of SNS active users is said to have exceeded 35% of the world population. That is because there are two characters of SNS.

A. Anytime Communication

Being different from a telephone, the user can contact the other person at his or her convenience.

B. Quick Communication

Quicker and easier communication than emails is required. Relatively short and simple sentences are preferred.

SNS have a characteristic that allows anytime communication according to his or her convenience whereas they require quicker communication. The user can communicate with people in the distance.

In addition, he or she can do it at the available timing. They are communication tools that suit the needs of modern society and very convenient. They are used not only in schools but also in companies as a marketing tool or a method of their internal communication. SNS are expected to provide the equivalent quality to the other communication forms.

However, it is clear that expressive ability on SNS is poor. In communication by only texts, it is impossible to include nonverbal meanings as ones shown in facial expressions and voice tones. We have to convey true intentions only by purely meaning of the words. Due to insufficient expressiveness, it often happens that true intentions are not conveyed to the receiver even if the information transmitter thinks that they must be surely conveyed. Because of that, the human-relation troubles often occur. Improving expressive ability allowed in SNS without losing the quickness is a problem to be solved as soon as possible.

Therefore, we focused on "Fonts". Nowadays, Fonts are indispensable when creating something printed. Research of impression given by fonts is in progress. They are taken into account in various scenes such as bookbinding, comic balloons, posters, websites, television telops, and so on. Depending on difference of fonts, the viewer's impression of the text changes greatly. That can be understood from our daily lives even though it has no scientific foundation.

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In this paper, we aim to improve expressive ability for communication on SNS by using fonts.

II. EXPRESSIVENESS OF TEXTS

The function to complement text information has been added with popularization of the Internet. It is a function of "emoji", which started with the appearance of emails, and "Stamp", which has become popular in recent years. We present anew its expressiveness and problems about the two functions that has become common now.

A. Emojis

It is a function that can be used in almost all SNS. The user expresses his or her emotions by using various icons in the sentences. Various icons such as hearts, stars, animals, vehicles, facial representations and other objects are provided. They have an effect that emphasizes the words or makes them friendly. They are designed so that everyone can easily understand what they mean.

However, they have a problem that feelings about emojis are different depending on cultures or generations. Some people feel uncomfortable about the sentences with too much use of emojis, and others feel cold impressions to the sentences that do not have any emojis. The transmitter and the receiver do not always have the same impression to emojis. Another problem is emojis' limited variety. There can be many situations in which there are no appropriate ones when you want to use them to express something.

Fig. 1. Emojis

B. Stamps

They are not used in sentences. They are the images that have meanings, and functions only by themselves. Users can download sets of the images, called "Stamp" for free or by purchasing, to their own terminals. In 2011, "LINE", which is one of SNS launched this function. These days, Facebook messenger also has this function.

LINE started the service called "Creators' Stamp" in 2014. The service is to enable the users to create Stamps and sell them by themselves. By this service, a lot of Stamps have appeared, and the number is still increasing now. Many of Stamps have words by default. Therefore, it is possible to make a conversation just by exchanging Stamps. Depending on how to use them, they allow users very quick interactions.

The problem of this function is that it cannot make fine adjustment suitable for each situation. It is because that they are customized pictures in advance. Sometimes communication is difficult because the communication partner does not understand differences in delicate nu-

ances of Stamps. Stamps are a convenient and enjoyable function. However, it cannot be said that it enriches the communicative ability on SNS. Because Stamps have the wide variety and their each individuality, they rather make communication complicated.
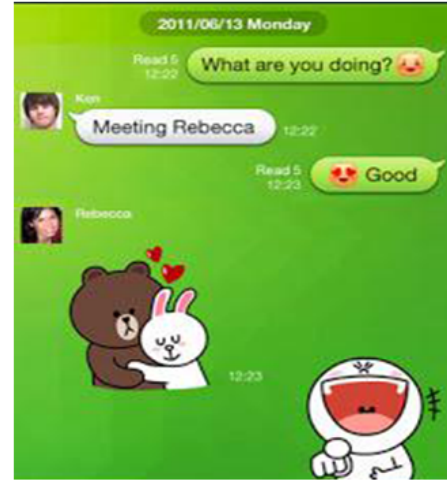

Fig. 2. line

Fig. 3. Fb messenger

Both are simple and convenient functions, and they are widely used in SNS as a matter of course.

However, they also have limits too. The importance of SNS into consideration, the expressive ability possible on SNS is not sufficient. The font change function is as simple as these two functions, and it is a function demanded by the people.

III. THE CURRENT SITUATION OF EXPRESSIVE ABIRITY ON SNS

We examine the expressive ability on SNS and messenger software, which are dominant in the world.

A. WhatsApp

Its expressiveness is poor because it has been spread instead of Short Message Service (SMS). As well as SMS, basically it is only for text communication. The additional functions to substitute the text's intention

are only emojis.

B. Messenger

It was originally a messenger software to be used in Facebook (SNS app). Today, it can be used as an independent messenger software.

It has a Stamp function as previously mentioned. However, it is impossible to express the user's emotions of the moment with sensitivity by the suitable Stamps.

C. LINE

It is a messenger software, which is popular mainly in Asia. Communication by Stamps is more common than one by texts, and there is a wide variety of Stamps.

However, the functions to enhance the text's expressiveness are only emojis and Stamps.

D. iMessage

It is one of SNS for the use among Apple products. It has functions that called "Sticker", which is like Stamp, "Sign", by which the user can send a message using the touch screen, and other various functions.

Whereas it has rich expressive ability, few people can fully make use of them because of too many functions. As a matter of course, it is unavailable for Android users.

In this way, major SNS have advantages and disadvantages and the user selects SNS to fit for his or her usage environment. What is common to all is that the "font change function" is not provided. The function has very high novelty. From this reason, high needs can be expected.

IV. RELEVANT STUDIES

A. Studies to Enhance the Expressiveness of Texts

By development of computer technology, the importance of texts is increasing. Attempts to enhance text information by using comic balloons or animations have been done for hearing-impaired people [1, 2]. Other than that, various systems have been proposed. There are systems that select fonts and colors to fit for the texts [3, 4], and also there are color poster systems that reflect sensitivity [5].

According to those related studies, approaches to add emotional meaning to text information is a theme with a lot of interests socially.

B. Impression Evaluations of Fonts

Impression evaluation experiments of fonts have been gradually increased. The idea that fonts give people certain impressions has become common. For example, there are a study that searched for relationship between voices and fonts [6], and also another study distills elements of quality evaluation from the font's figure. To clarify the impression of fonts from their figure is focus of people's attention because of its difficulty. All of those studies show that fonts have the power to give people unique impressions. It is clear that fonts affect information in text.

IV. RELEVANT STUDYS

Today, there are some smartphone applications (apps) with the font change function [7]. We explain about their basic system as below.

The users choose fonts to use in SNS, and types texts on an arbitrary picture. This picture will be output, and posted to SNS as a picture to be shared [8, 9, 10, 11]. Some apps enable the user to use emojis or change colors of the texts.

However, it is often the case that the actual image is different from the one on the preview screen, or unexpected line feeds are inserted [3, 12, 13].

The texts converted by these apps are often different from what the user expects. Most of these apps are hard to operate, not practical, and not useful very much.

VI. THE OUTLINE OF THE APPLICATION

The app proposed in this paper consists of two apps basically. First app adds the fonts change function to usual SNS or messenger apps. Second app supports the intuitive fonts selection. When changing fonts, the user can select fonts that reflect user's emotion more intuitively [14, 15].

By combination of these two apps, it becomes possible to intuitively select fonts of SNS or messenger software.

A. The App to Add the Font Change Function

The fonts change using this app is realized by making an image of texts and sharing it. The image of startup screen is shown in Figure 1.

For the better expressiveness, this app has functions not only for the font change but also for changing font sizes, font colors, colors, and figures of the comic balloons [16, 17, 18].

Fig. 4. App1 execution screen

1) Preview: The texts that converted to an image are always displayed here for the user's check. The image of this part will be sent to the receiver.

2) Transparent background switch: The switch to make the background color transparent is equipped. By turning on this switch, the background color of the app becomes transparent. The user can activate the application and turn on this switch while the SNS app is running. Then, the image of the preview looks like to be displayed on the screen of the SNS.

By this function, the user can easily imagine the actual screenshot on which the posted image will be applied to.

3) Format settings: In this part, the user can choose the font, the color, the type, the size and so on. Format settings specified here is reflected to the image of the preview part in real time. The detail is shown below.

Fig. 5. Format settings

3-a: Font setting
3-b: Font size setting
3-c: Style setting
3-d: Font color setting
3-e: Balloon background color
3-f: Comic balloon setting

4) The part where the user can input texts and post the image to SNS:
The user can enter the text message in this part, and the image same as the one in the preview will be sent to SNS.

B. The App to Support Fonts Selection

The app to add the font change function to SNS creates images by applying arbitrary fonts. As a result, even to SNS and messenger apps that do not have the font changing functions, it is possible to post sentences with changed fonts. However, the process to change fonts is not necessarily intuitive because users have to specify every single setting. It takes a long time to post even one message, and that ruins the advantage of SNS, which is quick communication.

In this paper, we propose a support application that realizes intuitive and quick font change and add it to the previously developed app.

In this app, "Emotion map", in which common emotion expressions are distributed as a concentric circle is utilized instead of the user's specification of each font setting. Based on Robert Plutchik's emotional circle, we created a map to select emotions intuitively. The emotion that the user can add to the texts is nine in total; eight main emotions advocated by Robert Plutchik plus "normal".

The nine emotions are shown below.
1. Joy
2. Trust
3. Fear
4. Surprise
5. Sadness
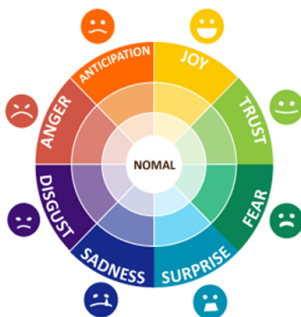6. Disgust
7. Anger
8. Anticipation
9. Normal

Fig. 6. The part to select emotions

The intensity has three levels for each emotion, and the user can express the total of 25 emotions. The position that is far from the center of the circle means high-intensity of emotion. The position that is close to the center of the circle means low-intensity of emotion. Fonts are set in accordance with these 25 positions.

When the user selects the position that fits his or her emotion and its intensity, the font will be changed to the suitable one. Table I shows fonts set for each position. The three levels of emotional intensity are expressed by weight of the characters.

TABLE I
AVAILABLE FONTS

Joy	**joy**
Trust	**trust**
Fear	fear
Surprise	surprise
Sadness	sadness
Disgust	disgust
Anger	**anger**
Anticipation	anticipation
Normal	normal

To emphasize intuitive operations, we improved the system so that the user can change the fonts by selecting the emotional icons. Figure 7 shows the completion image.
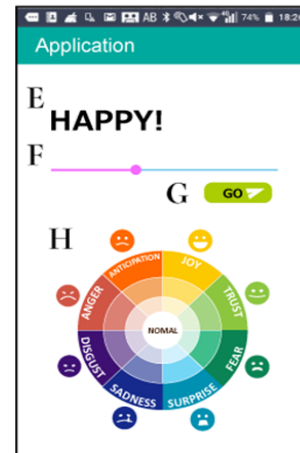

Fig. 7. Font selection by emotional circle

In this app, the parts that require the user settings were removed as much as we could to emphasize intuitive operations.

5) Preview: The user can check selected fonts in real time.

6) Size adjustment: The user can change the size of the texts by sliding the seek bar.

7) Share button: When this button is taped, the texts in the preview will be converted to images and shared to SNS.

8) Emotion selection: It is the map to select emotions (fonts) based on the emotional circle of Robert Plutchik.

C. How to Use the App

We explain how to use the app to support fonts selection with the emotional circle below.

Fig. 8. The image of fonts selection

1) Entering sentences: The user inputs sentences that he or she wants to post to SNS while checking the preview.

2) Size adjustment of the texts: The user can change the size of the texts using the seek bar.

3) Selection of emotion: The user selects the emotion that he or she wants to add to the texts.

4) Posting to SNS: When the share button is tapped, the picture in the preview will be shared on SNS as an image.

VII. DISCUSSION AND CONCLUSION

In this paper, we have developed the app to change the fonts by selecting emotions. With this app, the users can express their emotions more expressively by the texts as well as by emojis or stamps by changing fonts according to their emotions freely.

"Text only" communication became essential for our daily lives because of the widespread use of the computers and the Internet. This culture is prevailing rapidly nowadays. The cause is the popularization of SNS. In addition, we focused on fonts. Depending on difference of fonts, the viewer's impression of the text changes greatly. That can be understood from our daily lives. In such years that SNS communication is essential, the great needs or this app, which is added emotion to text by using fonts will be expected.

However, the relationship between fonts and emotions are still uncertain. The image of fonts is different each people's age or nationality. We would like to make further improvements so that the user will be able to select fonts that match to their user's feelings more accurately. For that, we need some the subjects of an experiment.

In this paper, we realized the front-end application targeting SNS. The function that changes fonts according to emotions can be applied to other cases. For example, as it was mentioned about in the precedent cases, one of them is a support to the hearing impaired people. In the limited situations where only text information is possible, it is expected that this function can be greatly useful. With the various fonts, they will be able to express their emotions in text more and more expressively.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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