

EmotiFONT

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Abstract: In this paper, an algorithm to make keyboard-typing more expressive and unique is proposed. The proposed algorithm can be employed to manipulate the thickness and size font being typed in a subtle way which is reflective of the way in which the user is typing. The algorithm will have two phases- calibration and expression-identification. The proposed algorithm relies on an accelerometer which is a prerequisite to measure the key parameters. The time of key press and the pressure exerted on the keys while typing will be the parameters measured and calibrated as per each user in the calibration phase. Then, in the expression-identification phase, the font size is varied as per the user's typing and it is made darker i.e. bold with a varying intensity thereby conveying the user's attitude and state of mind effectively and adding the user's signature style in typing. This can be used in any place where input is given through key boards (physical or virtual). This algorithm can be also employed to identify the user to some extent.

Key words- accelerometer, calibration , font manipulation, expressive keyboard

I.INTRODUCTION

Even if everyone uses the same pen to write a particular sentence today, each individual will have a different hand writing and neatness. Such provision is currently not there for a key board input. The keyboard does not recognize each person's individual style and provides the same output for all. The proposed algorithm conceptualizes a system in which the users are able to express their involuntary feelings of anger or anxiety which is evident from the manner of hitting of keyboard keys. Books will therefore become more expressive as the feelings of the author are directly reflected in the print of the font of that particular word. The typing of the person will thus be unique as emphasis of letters will be unique to his calibration and his mood.

II.RELATED WORK

Such techniques have only recently been explored in iPhones wherein the manner of playing the virtual piano in terms of the pressure exerted influences the audio quality of the tune being generated [1]. This emulates the real piano wherein on pressing a key harder, the pitch of the sound generated is higher. Such techniques can be extended to personal computers to incorporate the feature of expressive typing without any conscious effort from the user's side.

III.DESCRPTION

1. The user has to do one time calibration using his/her keyboard.
2. Type a sentence which has all the letters of the English alphabet from A to Z, punctuation and spaces (" ") in normal typing rhythm.
3. Use calibrating algorithm to customize the speed and pressure settings.
4. Using this feature will require a program running continuously which will modify the font based on the input parameters (time duration and pressure of key press)
5. This will be an added functionality and the user will have the provision to turn it off for formal communication.

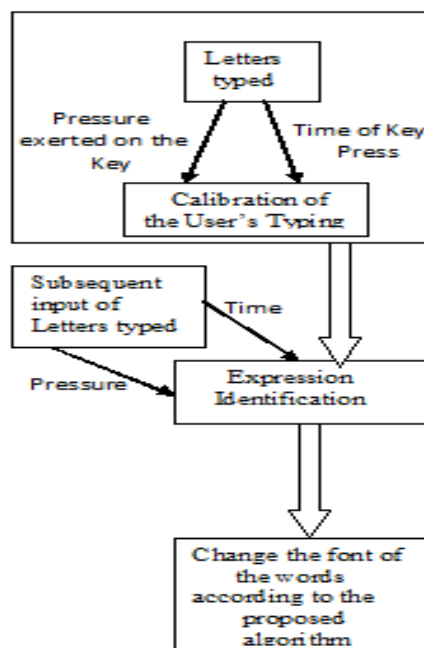


Fig1. Block diagram showing an overview of the system

IV. ALGORITHM

Algorithm for calibration of Expressive Keyboard:
Ask the user to type the following sentence:
"I am going to the zoo to see some jackals in queue and jump with a Xerox-copy of a vase and don't eat berry."

1. Make two float variables for every English letter of the key board.
 - A. Time T
 - B. pressure P
 - C. Assign x =average value of 100 samples of accelerometer in 10 milliseconds
2. Initialize T and P with the value 0.
3. Record the time of key hold by using the formula key Time of key hold=key press time in milliseconds - key release time in milliseconds
4. Add this to the letter variable L[T] as (existing value + new calculated value)/2
5. Record the pressure of key hit which is the maximum magnitude of the recorded accelerometer reading between the key press and and the key release event
6. Add this to the letter variable L[P] as (existing value + new value)/2
7. If count of keys pressed = no of ASCII characters in the input sample sequence then step 8 else go to step3
8. For all the rest of the keys of the key board input do the following:
Assign the average of known L[T] and L [P] to them.
For every letter $L_{tlow}=L[T]$, $L_{plow}=L[P]$
9. Repeat step 1 till step 8 for angry/ distressed writing
For every letter $L_{thigh}=L[T]$ $L_{phigh}=L[P]$

Algorithm for font manipulation:

1. Set the default font size 11
Key press (includes spacing biased on the words according to the font size of space character)
 - A. Key press=time stamp
 - B. Record pressure reading in temporary register (P) and if current pressure > pressure reading than assign the pressure reading to P
 - C. Key release= timestamp
2. $T=(\text{Key release timestamp}-\text{Key press time stamp})$
3. Identify letter
4. From that letter we have L_{tlow} and L_{thigh} For that letter hence we calculate

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addsize = (T-Ltlow)/(Lthigh-Ltlow)
if(addsize<0)
addsize =0
if(0<addsize<=0.25)
addsize =0
if(0.25<addsize<=0.50)

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addsize =1
if(0.50<addsize<=0.75)
addsize =2
if(0.75<addsize<=1)
addsize =3
if(addsize>1)
addsize =3

```

Therefore the font size for that letter for displaying is $(11+addsize)$

5. The thickness of a font when it is completely bold=1
Boldness/ thickness of the displaying character = $(P-L_{plow})/L_{phigh}-L_{plow}$

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if(b<0.5)
Bold_font=false
else
Bold_font=true

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Example:

Input : aAaAaAaAaAaAaAaAaA

Usage in a sentence:

Today is **the happiest** day of my life!

i am worried

don't talk to me like that.

URGENT! look at the notice board tomorrow

Fig 2: Usage of EmotiFONT while typing

Fig.2 illustrates the output of typed text when the proposed algorithm has been employed. The specimen sentences create a visual impact to bolster the reader's understanding of the underlying emotional state of the typing user while giving the necessary emphasis to important words without any conscious effort on the typist's part.

V. ADVANTAGES

Currently the input system of the keyboard is same for all and there is no uniqueness in the font a person writes. It will now be possible to express emotions when we type without needing to resort to the use of emoticons. This will certainly have a broad scope of applications in chat forums, informal letters, messages, notes, etc. These would become more intuitive, interesting and expressive by virtue of implementation of the proposed algorithm. Furthermore, if employed by the publishing industry, the novels/poems which are printed will be now more expressive which will also involve the feelings of the writer/poet. The proposed algorithm promises to bring individuality by incorporating each user's typing rhythm into passive, common font.

VI. LIMITATIONS

All keyboards must have an accelerometer. As the time stamp of key press and release are recorded there is more processing than it is required without the use of this system. Also, since the manner of typing can change even for a single person over time, the calibration phase will have to be repeated for the correct expressiveness while typing on the keyboard.

VII. CONCLUSION

Typing will become more expressive and it will now be possible to express emotions in a faster and a more intuitive manner. There would be no need to change the

font manually as the proposed algorithm, if implemented, will detect and portray such changes automatically. Also, the need to resort to emoticons to express the emotional attitude/feeling of the author/writer will be eliminated.

VIII. FUTURE SCOPE

In future, this system could be extended as a security measure to be used along with password to authenticate a person. It would add an additional layer of security to the already existing authentication methods.

REFERENCES

- [1]<http://www.macworld.com/appguide/article.html?article=143>
- [2]http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5553840