

RECOGNIZATION AND RECOMMENDATION OF HANGUL FONTS USING COMPUTER VISION BASED TECHNIQUES

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Fonts are a set of pre-designed ... I don't know what should go in to an abstract. PLEASE FILL
ME IN

Objective: This project recognizes different Hangul fonts based on Computer Vision Techniques and provide
akin fonts that avoids legal issues.

1. INTRODUCTION

From the monospaced fonts on a VT100 terminal to the Seoul fonts by the Seoul city government, the range of available fonts to users have expanded, due to the rise of tools for font creation.

Fonts are predefined collections of letters, varying in design and size. Different fonts are utilized based on the purpose of the user, as an intermediary of the user's purposes and emotions.

However, as more and more fonts are being introduced to the market, the quest for the appropriate font is either an evergoing battle with vast images, or an effortless defeat, known as the default font. Even when one has a desired font with its image in hand, the search is analogous to finding a needle in the haystack. Also, finding the appropriate font is not just a matter of choice, as it can spur legal disputes as well.[1]

As of now, there is no way to search the desired font from an input of image one has found in books, magazines, or from a street sign;

Compared to Hangul fonts, English fonts consist of 26 upper and 26 lower case letters, a total of 52 characters. The limited number of characters, and their simple form makes English font recognition not as challenging and previous researches have produced high recognition rate(add reference?),

However, the Hangul font consists of 2,350(KS X 1001) or 11,172(KPS 9566) characters, each composed of onset, nucleus, and coda. Due to this complicated format, research on font recognition of Hangul characters is not active, compared to other Latin alphabets. In this project, we will use KS X 1001 character set.

2. PAPER SURVEY

2.1. Classical Computer Vision

We shall utilize many techniques learned from our class and materials.

2.2. Optical Font Recognition Using Typographical Features

This paper[2] aims to identify typeface, weight, slope and the size of text from an image block without any knowledge of the content of the text.

2.3. Large-Scale Visual Font Recognition

This paper[3] addresses the large-scale visual font recognition (VFR) problem, which aims at automatic identification of the typeface.

3. KEY FEATURES

3.1. Separating Hangul character from image

We cannot expect input as an image of a single character. Input image may include many characters, so we should separate it character by character using xx technique.

3.2. Feature Detection

A Study on Typology for Hangul Fonts Identification and Classification in terms of character's typeface, character size and character slope and etc. based on Computer Vision Techniques.

3.3. Machine Learning(Optional)

Rather than conservative computer theories, we can use machine learning techniques in detecting characters or fonts. Mass of Hangul character fonts recognition with CNN, Hidden Markov Model with reference to paper[4] or other materials.

3.4. Estimating Surface Normal Vector of Hangul Fonts (Optional)

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4. ALGORITHM

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separate characters from input image
for each c in characters:
    find idx such that c == ref_font[idx]
    for each font in fonts:
        compare(c, font[idx])
    select most similar font
select font with most consensus

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5. EXPECTED RESULTS

We aim for the following goals:

1. Extract distinct features of Korean characters based on Computer Vision Techniques
2. Recognize/Recommend the provided font

6. DATASET

Since there's not enough data set existing, we will make new dataset. We will download .ttf font files offered by Naver Corp. Using the downloaded font files, we will generate 64 * 64 image file for 2,350 Korean letters. Therefore, there will be 2,350 * (# of distinct fonts) image files of size 64 * 64.

References

- [1] The Font Bureau, Inc. v. NBC Universal, Inc. et al
<https://dockets.justia.com/docket/new-york/nyedce/1:2009cv04286/296847>
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- [5] D. Ham, D.Lee, I.Jung and I. Oh. *Construction of Printd Hangul Character Database PHD08* Journal of the Korea Contents Association, vol.8, no.11, pp. 33-40, Nov. 2008.