

# Eazyhand – Scalable Conversion of Typed To Handwritten Font

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*Abstract- All the latest inventions in information and communication technology, such as word processing, fax and e-mail impress in writing. The worldwide introduction of digital messages has given handwritten communication a special character approaching the status of important and personal messages. But what can an author do if, for example, a stroke changes your handwriting, affect your style and reduce the legibility of your messages?*

*Indexed Terms- Handwriting, conversion, text, scalable conversion.*

## I. INTRODUCTION

Our proposed system is a new alternative that gives the author the ability to render and print new text using the original pen-on-paper script Style. As a single entry in our system, the end user adds a sample of the author's handwritten text and calibrates the printer treatment.

Various speech bubbles consist of handwritten letters; With Synthesis, you can maintain style when localizing into a foreign language. The handwritten text also allows this many creative uses, such as B. Personalized books - Sensitive materials such as credit card signatures. Transcript Information Base contains 26 preparation photos, 26 acceptance photos and 26 test photos. Handwriting is a technique that uses image capture, to enhance and generate text in your writing.

## II. LITERATURE REVIEW

Abhishek Bal and Rajib Saha I proposed in 2006 [1] a method for skewness detection and normalization using orthogonal mapping. The proposed method was tested on a sample database. The proposed method is able to capture the exact bevel angle and is also

complete to normalize the tilt angle. The result of the experiment shows that the proposed system almost achieves higher and better accuracy in all kinds of tilt angles.

### i. Text Synthesis

According to [Wei et al., 2009][2], handwriting synthesis has innumerable similarities to plaintext synthesis. In both cases, the aim is to generate new credible images from existing examples. [Simoncelli., 2000: Lewis., 1984 and Portilla] [3] Previously proposed Texture synthesis approaches were parametric. The realistic synthesis of a much wider range of textures has become possible thanks to the emergence of non-parametric methods that sample image fragments from the input sample [Efros and Freeman 2001][4]. was a significant change, but at the expense of artistic control through adjusting settings. [Kwatra et al. 2003] [2]. several text synthesis approaches that can be explicitly monitored. This is simulated by capping the flowers to the highest position so the canvas comes from reduced versions of the input. The user then considers the indicated line continuity when the painting that [Sun et al. 2005] [5]. Our model is also a kind of structural synthesis of the plot in which the text is placed. The rendering is parameterized by the user's input, but the design is not parametrically sampled by the tagged image's first attempt at calligraphy on paper. From the user's point of view, this is ideal.

### ii. General Handwriting

We collect data offline. Handwritten text properties are analysed at multiple scales, from pixel sections to temporal information where applicable available. After extracting features, the classifier recognizes whole words or individual characters. We use the pixel slices character recognition method. Writer's Fit [Connell and Jain 2002] [6] involves fitting the

trained model to match a specific author and improve recognition accuracy. [Shilman et al. 2006] changed their model when the user corrected it exit error. Synthetic text generation has proven to be very useful and effective in improving and improving Printed word recognition in the natural environment proposed by [Parizi et al. 2014] [7]. [Kautz and Campbell.,2014][8] suggests that there are methods to automatically interpolate characters with similar topology, but the same borders. It is extremely difficult to accurately reproduce someone's handwritten text with current font engines to solve this problem, we generate the textures directly. Guyon [1996][9] acquired common two- and three-letter slate sequences to overcome some of the limitations of the character-based approach. However, their results appear unnatural for a combined write, as two and the three sequences of letters are combined. However, as far as we know, they are the only other point that should be considered Pen use pressure and angles of movement to guide the calligraphy-like pattern. In our system, we capture the texture of the original paper pen rendered as sample images instead of rendering ink curves, with the option to substitute others handwritten text fonts. Garner [2005][10] showed that adding a handwritten note to a survey can increase the response rate from 33% to 70% - more than double. Our main contribution is to design a system that renders new text in a specific format Handwriting style of a person writing on paper with a pen.

*iii. Proposed Work*

When a sample of an individual's handwriting is provided, care should be taken to ensure that the handwriting appears in the same style as realistic with custom words. There are two phases: First, the author's sample is collected and analysed, Fig. 1. Second model provides each client with the specified target text as "handwritten" output, Figure 1.

Finally, further post-processing can be done that can be relied upon the use case. The input to the system is a sample of the author's digitized handwriting, such as the digitized written text of a document. Before synthesis can take place, the sample must be analysed.

The markup is semi-automatic, it consists of extracting the path from the text and then splitting it into a handwritten font. After analysing a sample of the author's handwriting, it is common to render the new text as "Calligraphy.

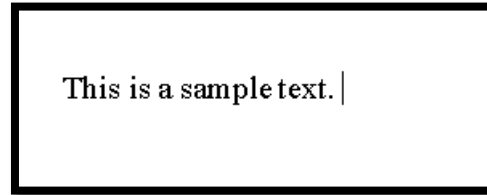


Figure 1.1. Typed text written in notepad

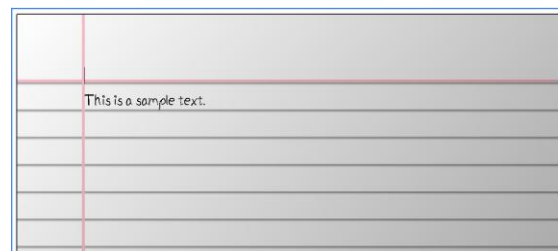


Figure 1.2. Same text written in handwritten font

In EazyHand we can even change the colour, Font-Size of text and align the converted text according to our requirement.

III. ALGORITHM USED

The process of converting typed font to handwriting-like representation can be achieved by using a combination of image processing techniques and mathematical operations. One such approach is using a combination of image thinning, skeletonization, and stroke width variation.

*i. Image Thinning*

Image thinning is a process of reducing the thickness of lines in an image, it is used to convert the typed font into a more handwriting-like representation. The mathematical morphological operation of erosion and dilation are commonly used in this step, the whole step being boiled down to figure 2.

Erosion: The erosion of an image  $f$  with a structuring element  $B$  is a mathematical morphological operation

that erodes the boundaries of the image, it is represented mathematically as

$$fB = \{x \mid B(x-y) \leq f(y) \text{ for all } y \text{ in } B\} \text{ (I)}$$

where  $f$  is the input image,  $B$  is the structuring element and the resulting image is represented by  $fB$ .

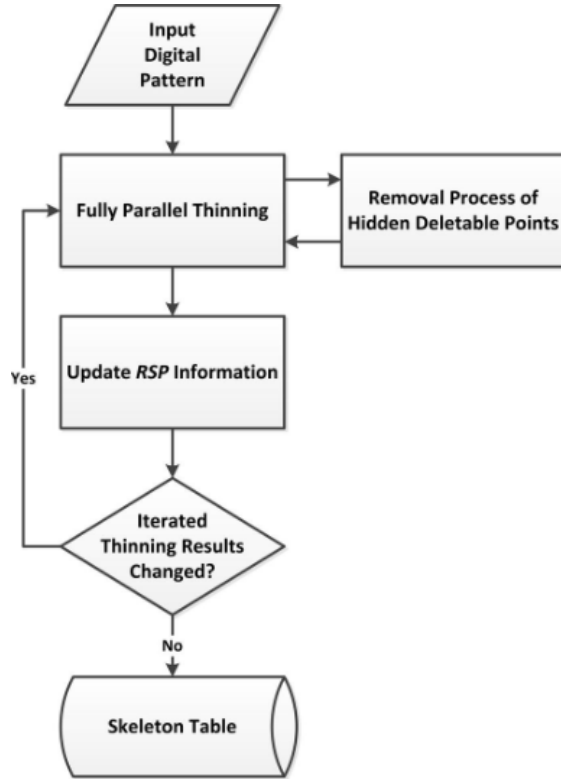


Figure 2. Flowchart of steps involved in Image Thinning

Dilation: The dilation of an image  $f$  with a structuring element  $B$  is a mathematical morphological operation that dilates the boundaries of the image, it is represented mathematically as

$$fB = \{x \mid B(x-y) \geq f(y) \text{ for all } y \text{ in } B\} \text{ (II)}$$

where  $f$  is the input image,  $B$  is the structuring element and the resulting image is represented by  $fB$ .

Thinning: It is a mathematical morphological operation that reduces the thickness of the lines in an image. It is based on a mathematical morphological operation called hit-or-miss transformation, the mathematical formula is

$$fJ = f - (fB1) \cap (f*B2) \text{ (III)}$$

where  $f$  is the input image,  $J$  is a structuring element that represents the thinning operation and  $B1$  and  $B2$  are structuring elements that are used to identify the pixels that should be removed from the image.

ii. Skeletonization:

It is the process of reducing the structure of an object to a set of thin lines, it is used to remove the unnecessary pixels from the image thinned image. The mathematical morphological operation of thinning can be used to achieve this step. In addition to thinning, a post-processing step called pruning can be applied to remove pixels that do not satisfy certain conditions such as connectivity or thickness, as shown in figure 3.

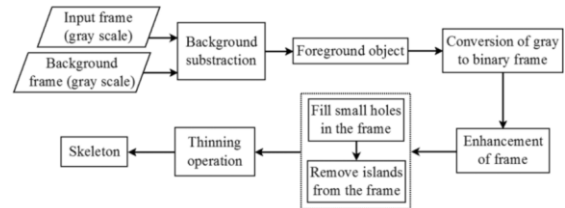


Figure 3 Steps involved in Skeletonization

iii. Stroke Width Variation:

It is a technique used to add variability to the width of lines in an image, it can be represented by mathematical functions that control the width of lines based on the local characteristics of the image such as the gradient or the curvature. One example is the formula used in the curvature scale-space representation which is

$$K(x,t) = (Ix^2(x,t) * Iy^2(x,t) - Ixy^2(x,t)) / (Ix^2(x,t) + Iy^2(x,t))^2 \text{ (IV)}$$

Where  $Ix$  and  $Iy$  are the partial derivatives of the image with respect to  $x$  and  $y$ , respectively, and  $t$  is a parameter that controls the scale.

Overall, the combination of image thinning, skeletonization, and stroke width variation is a powerful approach for converting typed font to

handwriting-like representation, it can be represented as a pipeline that takes a typed font image and applies image thinning, skeletonization, and stroke width variation to the image to make it more similar to handwriting. These steps typically require the use of mathematical morphological operations and mathematical functions to control the width of lines based on the local characteristics of the image.

#### IV. EXPERIMENT RESULTS

When a sample of an individual's handwriting is provided, care should be taken to ensure that the handwriting appears in the same style as realistic with custom words. There are two phases: First, the author's sample is collected and analysed, Fig. 1. Second model provides each client with the specified target text as "handwritten" output, Figure 1. Finally, further post-processing can be done that can be relied upon the use case. The input to the system is a sample of the author's digitized handwriting, such as the digitized written text of a document. Before synthesis can take place, the sample must be analysed. The markup is semi-automatic, it consists of extracting the path from the text and then splitting into a handwritten font. After analysing a sample of the author's handwriting, it is common to render the new text as "to write." The system with our algorithm was validated experimentally to measure the realism and stylistic similarity of the handwriting. Text and demonstrate typed text in a handwritten font. We have presented a text conversion system that can convince Reproduce a specific author's handwriting for specific text in a document. It is partially monitored when the user selects the target text, which interaction is required in our use cases. Then it will generate the exact text conversion needed for clear writing that matches the target text without further user intervention (unattended). We used our dataset to quantify what we do and Added examples of different handwritings for qualitative results. In the beginning, noise reduction techniques used handwritten text documents at the noise. Image quality is improved by removing noise from a handwritten text report. The thresholding technique is applied to a noiseless grayscale handwriting image to convert the image to grayscale. So the proposed method is used for the conversion. Handwritten documents must remain free during the recognition

process unbalanced tilt angle for better detection. Here the proposed method calculates the threshold to be distinguished.

The input shown in Figure 4 is the text entered into the document in Algerian format. Figure 5 shows synthesised sentences in a handwritten style. So far we have only studied the English alphabet. There are two methods for converting text handwriting based on source code.

- a) The source text is given in a form of document and the final output is given in an final\_output.pdf form by the processed system.

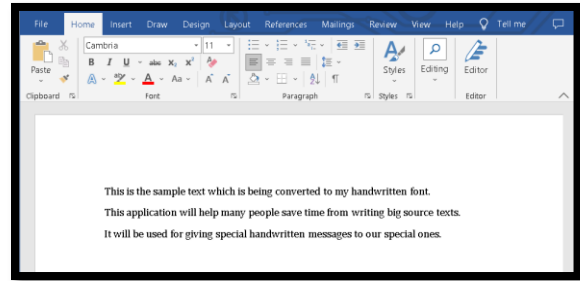


Figure4. Example of Sample Text in a document.

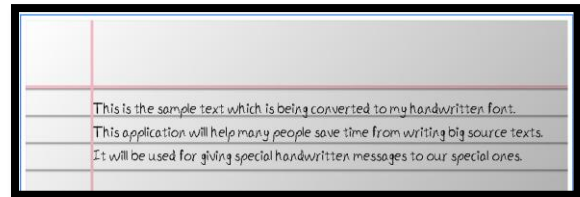


Figure 5. Example of the Output in user's handwritten font.

#### CONCLUSION AND FUTURE SCOPE

This article provides an analysis of a text-to-write document with bevel detection, keystroke detection, and text Segmentation of italic text documents that can be converted to the user's writing style. The proposed method was applied to over 500 text images and manuscript sample images collected from various authors from all walks of life. With the proposed technique, 93.47% of the lines and 90.41% of the words are segmented accurately from the data set. The suggested work also standardizes 95% of lines and words with negligible error rates without errors.

The proposed technique can be used with almost similar precision to the compositional styles of different dialects. Future Work has provided a sufficiently large database Samples can solve the cover problem by finding authors with similar writing. Our optimization strategy assumes the output goes to a blank canvas. Instead, it may be possible to correct the documents by adding another section for the ruled page system so the rendering result should be within the specified lines of the page. May contain more handwriting features than offered the method, like recognizing character and other personality traits, decides to replace and get the shortcomings and some fixed factors a stronger image. Overall, the future goal is to develop a behaviour analysis tool that can predict traits and computer-controlled attributes unrelated to humans.

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