

SOME NEW GLOBAL PARAMETERS TO QUALIFY THE HANDWRITING

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Abstract

This paper takes place in the field of handwriting analysis. More precisely, our aim is to extract some information from the writing image itself. An OCR could improve its recognition rate from this information. We are concerned with 300 dpi off line text, and are working on the binary images of the text lines. We are establishing the definition of some new parameters that rely on the evolution of line profiles when changing observation scale. We show how these parameters can quantify such properties of handwritten texts as the degree of loops on stroke or the average leaning, for example. Also, some experiments have been pursued on printed texts in order to have a reference.

Introduction

Nowadays each scanner is working together with an OCR software; nevertheless, it has to be observed that in nearly all the recognition methods, an analysis of the writing is only very superficially performed. The goal of our study is to discover new parameters that would enable the improvement of the recognition step by use of a pre-clustering of the writings according to the writing style.

In fact, when applying fractal tools to the study of writing profiles, we are going to show in this paper that it is possible to find, out of the written information, some criteria relying on global geometrical singularities, on legibility and on the importance of the details. More over, when used under some conditions, this tool can give way to the size of the writing. Besides, this study shows that it is possible to get a measure of the degree of loops on strokes. In the same way, the global leaning of a handwritten sentence is been reached.

After the measurement principle is explained, we precise the parameters that have been introduced. Then we present the discrimination results it has been possible to achieve.

1 Recall on fractal geometry

1.1 Definition of a rectifiable curve

If $\Gamma(p)$ is a curve (figure 1.1), it can be approached as the union of all straight line segments $\eta(p)$. A measurement of its length is reached by the summation of the measures of elementary length of the segments : $\eta(p)$. The segments and their length will be both denoted by $\eta(p)$.

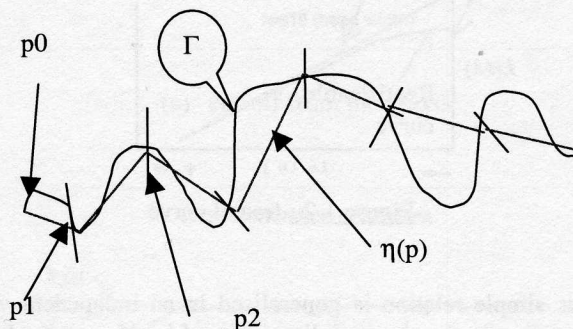


Figure 1.1 : rectifiable curve.

The curve is rectifiable, if a limit of the measure exists when unit scale becomes small. This measurement is the most accurate as the number of straight segments is higher and their length is smaller. This is why it is called by the geometrician the surveyor method.

