

Background Surface Estimation and Stroke Edge Detection by Using Document Image Binarization

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Abstract:- Badly degraded document images of text is very challenging task for segmentation .in this paper presents binarization technique ,to segment the text from badly degraded document images perfectly. this technique is based on text document usually have uniform color and texture. it has different intensity level. In the proposed technique, firstly background surface of document estimate through the polynomial smoothing procedure and compensated with different type of degraded document. then using compensated document detecting text stroke edge by using image gradient. finally segmenting text of degraded document by a local threshold, that estimated based on detected text stroke edge.

Keywords- Degraded Document Images, Polynomial Smoothing, Image Gradient, Binarization.

I. Introduction

The optical character recognition and retrieval of document image are a image processing related application .document image binarization technique is important for the document image processing task for these application.gray scale image is converted into binary image by using binarization technique. though document image image binarization has been studied for many years, but thresholding of degraded document images is still unsolved problem. So binarization is fast and accurate method.

II. Literature Survey

One characteristic of our proposed method is that it Last estimates a document background surface through an one-dimensional iterative polynomial smoothing procedure Compared with the document background surface estimated , the document background surface estimated through polynomial smoothing is smoother and closer to the real document background surface. Therefore, it is more suitable for the compensation of the variation of the document image contrast that often results from certain document degradation such as uneven illumination and smear. In addition, the proposed method makes use of the text stroke edges to estimate the local threshold and accordingly overcomes the limitations of many existing adaptive thresholding methods such as those window-based methods that often falsely detect text pixels from the document background. Furthermore, it makes use of L1-norm image gradient that is often more suitable (compared with the

traditional edge detector and the edge proper used) for the text stroke edge detection based on our empirical observations.[1]

III. Architecture of Proposed System

In this section we propose a five method.

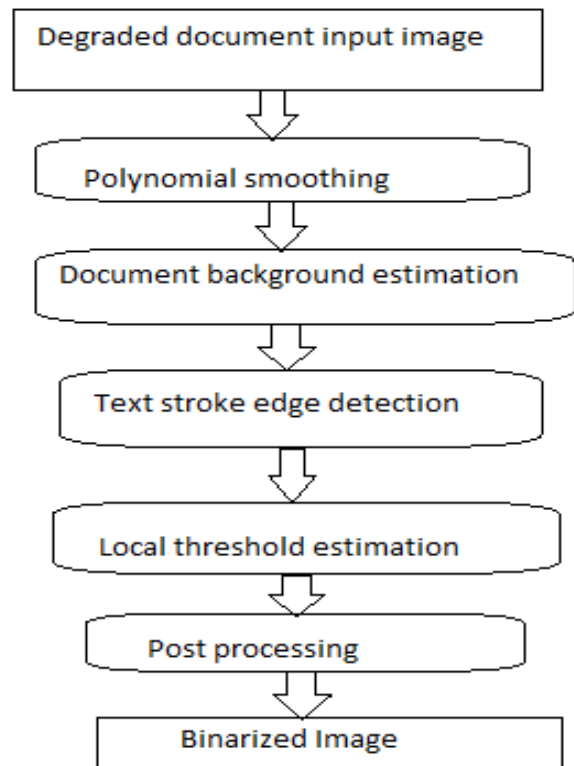


Figure 1-Block diagram

1. Polynomial Smoothing

firstly we describe the difference between smoothing and polynomial smoothing, these are used in document background surface. Smoothing is a process by which signals are weighted within a local neighborhood window and polynomial smoothing aims to fit a least square polynomial function to the signals within a local neighborhood window.

2. Document Background Estimation

Document background estimation is divided into one row or column. Firstly, take sample image document, fit it into a smoothing polynomial of initial order and sampled image data. Evaluate the maximum fitting error between sampled data and fitted smoothing data. Then refit a smoothing polynomial of higher order after repeating previous two steps iteratively until the maximum fitting error is small than the threshold.

3. Text Stroke Edge Detection

It is used for document image thresholding, but badly degraded document images stroke edge is not detected properly because different type of degradation such as noise within document background, uneven illumination or document seamer. We detect text properly by using local image variation before evaluating local image variation, global variation document image contrast compensated so that text stroke better detected. [3]

4. Local Threshold Estimation

After detecting text stroke edge, just calculate the most frequently distance between two adjacent edge pixels. Then scanned the edge pixel row by row. Edge pixel labeled as 0 and next pixel labeled as 1. It should be higher intensities. So improperly detected edge pixels are removed and construct histogram.

5. Post Processing

In document image thresholding often a certain amount of error by correcting them using post processing. There are three operations of post processing to correct the document thresholding error [1]. Firstly, remove the text component of a very small size. It simply removes the text that contains no more than three pixels on our system. Secondly, removing falsely detected text component that has a large size. Finally, single pixel along the text stroke boundary after the document thresholding.

IV. Conclusion

Document image binarization technique is useful for document background surface and estimating text stroke edge. By using polynomial smoothing procedure to estimate background surface effectively, text stroke edge is detected based on the local image variation. Finally, estimating local thresholding based on the detected stroke edge pixels within local neighborhood window.

ACKNOWLEDGEMENT

We are sincerely thankful to our institution, department and our staffs for their support.

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