

A REVIEW PAPER ON RESTORING THE DEGRADED IMAGES USING DIFFERENT THRESHOLDING TECHNIQUES

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Abstract: Now a days, improvement in a degraded document images is one of the most challenging research. Most of the ancient documents and historical documents were originally written in text paper documents. These types of documents are degraded and it is very difficult to read and difficult to recognize a text in the document. This kind of degraded noisy images can be restored using binarization technique. Restored images will contain clear background and foreground. The main goal of this paper is to compare different text document restoration techniques that calculating the threshold values of Black and white images to differentiate foreground and background clearly. Now a days Restoration of Images plays major role in restoring the old text documents. Here we are going to review different text restoration techniques.

Keywords: Adaptive image contrast, grey scale method, post processing, document image processing, degraded document image binarization.

1. INTRODUCTION

In Human society, the dominant information medium is document. Hence document Image Restoration is considered as one of the research task in Image Processing. There are many Images of old documents are helpful for us, due to non-maintenance these images are degraded and becomes unreadable. Also some of the images are blurred, noisy and insufficient spatial and temporal resolution. These images becomes degraded images and we can't use them though they are very useful for us. Also some of the images degraded normally due to some quality problem so that useful image becomes one waste image for us.

Degraded document images are in the form of mixed foreground and background text. We can separate this foreground from background text. The proposed way gives the efficient way to separate the text from noisy background pixels. Primarily image binarization approach is a segregation of pixel values in two different groups, white as background and black as foreground[10]. The thresholding technique plays essential role in restoration of foreground from background of document image. A single thresholding technic is not enough to solve different issues so lots of binarization technics are required. Here in this paper we gone through different binarization technics of Image Restoration

2. THRESHOLDING ALGORITHMS

2.1 Iterative Multi model Sub image Binarization for Handwritten Text Segmentation.

The Binarization techniques has two types, they are global and local algorithms. In that, Global thresholding algorithms uses a single threshold and Local thresholding algorithms uses a separate threshold for each pixel. Here a new kind of Binarization was proposed where the input image is separated into number of sub images. Here each separated sub image provides a numerical model for the handwritten text[12]. It can be used to optimize the binarization of other sub images which was based on the grey level and stroke-run features. The proposed method uses these models to iteratively arrive at the optimal threshold for each separated sub image. It is performed on various kinds of document images where prior knowledge about the disruptiveness of the sub images is not obtainable[8]. Finally, the experimental results showed better performance and the improvement in binarization quality when compared with other well-established algorithms.

2.2 Efficient Computation of Adaptive Threshold Surfaces for Image Binarization.

The limitation of the binarization of grey level images was it reconsidered the no uniform illumination. In this paper, an Efficient Computation of Adaptive Threshold Surfaces for Binarization of the image was proposed[13]. By using threshold value, the Adaptive Threshold Surfaces Method constructs the binary image. The threshold value is chosen by the successive over relaxation as the solution of the Laplace equation, and then this value was compared with each pixel in the grey level image to create a binary image. The high image gradient value denotes likely the object's edges and also there the image values which was between the grey level of the background and object. This work also proposes a different method to evaluate an adaptive threshold surface[1]. Finally, experimental results had proved that the threshold surface constructed which has less complexity, smooth and also a better visual and binarization performance.

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2.3 A Recursive Thresholding Technique

A Recursive Thresholding strategy for Picture Division was performed by expanding the Otsu's technique. This strategy depends on discriminant investigation and the edge operation. This technique is considered as the separating the pixels of a picture into frontal area and foundation. The new approach had actualized in the scope of record pictures, particularly genuine bank checks[11]. The recursive strategy is produced with no limitations on the quantity of items in the computerized picture. This approach removes the brightest homogeneous question from an information picture at every recursion, and takes out the darkest homogeneous protest after the last recursion.

2.4 Archive Picture Binarization Utilizing Foundation Estimation and Stroke Edges

Document binarization strategy issues can be overcome by utilizing versatile picture differentiate method. Nearby picture differentiate and the neighbourhood picture slope are mix alludes to the versatile picture differentiate. This method makes tolerant the content and foundation variety caused by various sorts of archive corruptions. Neighbourhood picture differentiate and the nearby picture slope both the procedures are valuable where the division of content from the foundation is basic. For edge recognition and to distinguish content stroke edges of record picture viably, picture slope highlight has been broadly utilized. To suppress the background varieties, neighbourhood differentiate assessed by the nearby picture greatest and least.

2.5 Otsu's technique:

Otsu's technique is utilized to consequently perform grouping based picture thresholding or the diminishment of a dim level picture to a double picture[13]. The calculation expect that the picture contains two classes of pixels, one is closer view pixels and other one is foundation pixels. At that point it figures the ideal limit isolating the two classes so their joined spread is decreases or equally with the goal that their between class change is maximal. Otsu's strategy is approximately a one-dimensional[1].

Otsu's technique displays the generally great execution if the histogram can be accepted to have bimodal dispersion. Yet, in the event that the question territory is little contrasted and the foundation zone, the histogram never again shows bimodality and if the fluctuations between the protest and the foundation powers are relatively huge to the mean distinction, or the picture is seriously adulterated by commotion, the sharp valley of the dark level histogram is corrupted.

2.6 Dynamic Threshold Binarization:

The binarization techniques, for example, cycle strategy characterizes the limit of a pixel with the dark level estimations of its own and neighboring pixels and the facilitate of every pixel. This picture binarization strategy is ordinarily utilized for the awful quality pictures, particularly the pictures with single – crest developed histogram. In any case, attributable to the dynamic edge figuring, the strategy has high calculation unpredictability and moderate speed.

2.7 Post processing

The binarization result is additionally enhanced by post handling. The confined closer view pixels that don't associate with other forefront pixels are sifted through to influence the edge pixel to set decisively. The area pixel combine that lies on symmetric sides of a content stroke edge pixel should have a place with various classes (i.e., either the record foundation or the frontal area content). One pixel of the pixel match is in this manner named to the next classification if both of the two pixels have a place with a similar class. At long last, some single pixel curios along the content stroke limits are sifted through by utilizing a few coherent administrators and subsequently the picture is fragmented.

2.8 Adaptive image constraint:

The versatile picture differentiate is a blend of the neighbourhood picture differentiate and the nearby picture slope that is excessively learnt, making it impossible to content and foundation variety caused by various sorts of report corruptions[3].

2.9 Kim's Method

Kim's technique experiences variable quality of characters in any case, has great outcome in most extreme info archive pictures. This technique proposes a neighborhood versatile thresholding strategy where a picture is viewed as a 3D territory. The neighborhood property of this model is described by a water stream display[12]. The water stream display locally distinguishes the valleys comparing to areas that are lower than neighboring districts.

2.10 Niblack and Sauvola Thresholding:

Niblack and Sauvola thresholds are local thresholding techniques that are used for those images where the background is not uniform[7]. Instead of calculating a single global threshold for the entire image, several thresholds are calculated for every pixel by using specific formulae that take into account the mean and standard deviation of the local neighbourhood (defined by a window centred around the pixel). Parameter window size determines the size of the window that contains the surrounding pixels.

3. CONCLUSION

This paper introduces a review of archive picture binarization blend structure that enhances the execution of detailed report picture binarization techniques. The given structure isolates the picture pixels into three classes in light of the paired consequences of given report binarization techniques. Every one of the pixels are then anticipated into a component space. The pixels in frontal area and foundation sets can be seen as effectively marked specimens, and used to decide the name of those dubious pixels. A classifier is then connected to iteratively order those dubious pixels into frontal area and foundation

4. REFERENCES

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