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Novel Technique for Layout and Handwritten Character Recognition in OCR

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ABSTRACT

As the result of enhancement and improvement in optical character recognition , various techniques have been implemented for handwritten character recognition. Document analysis and recognition plays a vital role in transferring the data between human being and computer. Segmentation of document is the very foremost step in document image analysis. Document segmentation is defined as the technique in which we chunk or partition our both homogeneous or heterogeneous data. Heterogeneous data is called as the data which contains printed text or handwritten text or graph or all of these together in one single document .Segmentation of the document is required because OCR is not able to recognize the whole document which contains multiple data types. Therefore first of all document segmentation is to be applied on handwritten bills which contain heterogeneous data type in order to differentiate between printed text and handwritten text.

Keywords: Segmentation, Documentation. Layout segmentation, Text segmentation

1. INTRODUCTION

Image processing is the procedure of conversion of an image into digital form and perform few actions over it, in a manner to obtain an intensify image or to obtain a few relevant details out of it. It is a kind of signal dispensation in which input is taken as an image, and an output perhaps be an image or features related to the picture. Basically **Image Processing** system handles images as 2D signals while implementing predefined set signal processing technique to them. It is one of the fast augment automation nowadays,with its applications in various fields of a business. Image Processing forms crucial research area within engineering and computer science discipline [1].Majority of image-processing techniques consists of considering the image as a 2D signal and be relevant to standard signal-processing techniques to. Handwritten Character Recognition is very interesting and demanding field of pattern recognition.Image processing mainly allude to digital image processing, but optical and analog image processing can also be possible. The procurement of images is referred to as imaging [2].Image processing is referred to refinement of a 2D image by a computer. An image defined in the "real world" is considered to be a function of two real variables, for example, a(x,y) with a as the amplitude (e.g. brightness) of the image at the real coordinate position (x,y). An Image is considered aught more than a 2D Signal.

1.1. **Segmentation*:*** Segmentation divides an image into definite area having all pixels for image analysis and interpretation, the areas must stoutly show a connection to relate objects or features of interest.Segmentation is the initial step from low level Image Processing converting a grayscale or color Image into one or more other images to high level.

In the natural language processing segmentation is mainly carried by three steps :-

a) Image segmentation: Image segmentation is defined as the procedure of segmenting a digital image into various segments. The main aim of segmentation is to analyze and or transform the depiction of an image into something that is more significant way that is more easier to analyze.

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b) Text segmentation: Text segmentation is defined as the crucial measure for the OCR. Text segment is defined as the manner of partioning the written or printed text into meaningful units like words, sentences. In the text segmentation heterogeneous data is taken .Heterogeneous data consist of the data which consists of graphs, tables ,handwritten and printed data[6].

c) Document segmentation: Almost entirely of the documents consist of the amalgamate data means the data in the form of text, image, and graphs together. In order to segment these kind of data i.e heterogeneous data we need document segmentation. Heterogeneous data is easily transformed to electronic form with the help of OCR system for [7].

2. PROPOSED METHODOLOGY

Document segmentation is the basic step in document analysis. Document segmentation generally work on the blueprint of document moreover partition the page into printed and handwritten regions. Document segmentation provides the similar area to optical character recognition system for recognition of the data. Nowadays, it become very crucial step to store the document which is to be analyzed. For storing the data and for the analysis of document we need to proceed the document and for the performance of various operations on document we need document segmentation.

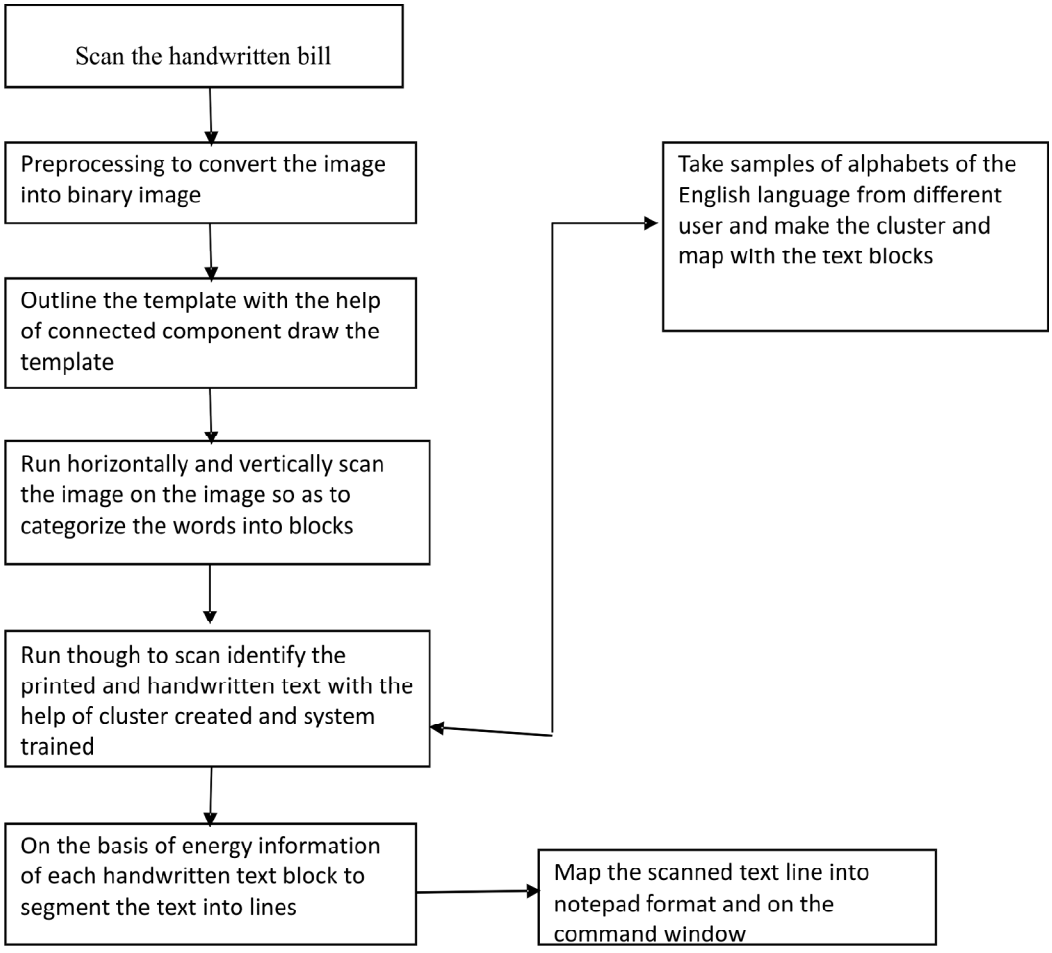

Figure 2.1: Flowchart of Methodology

In order to intensify the document segmentation technique there is basic requirement to partition the handwritten bill template which contains the amalgamate component like images,graphs,tables, printed text, handwritten text and the graphical image.

3. EXPERIMENTAL RESULTS

The whole scenario is implemented by MATLAB. All the results are shown following

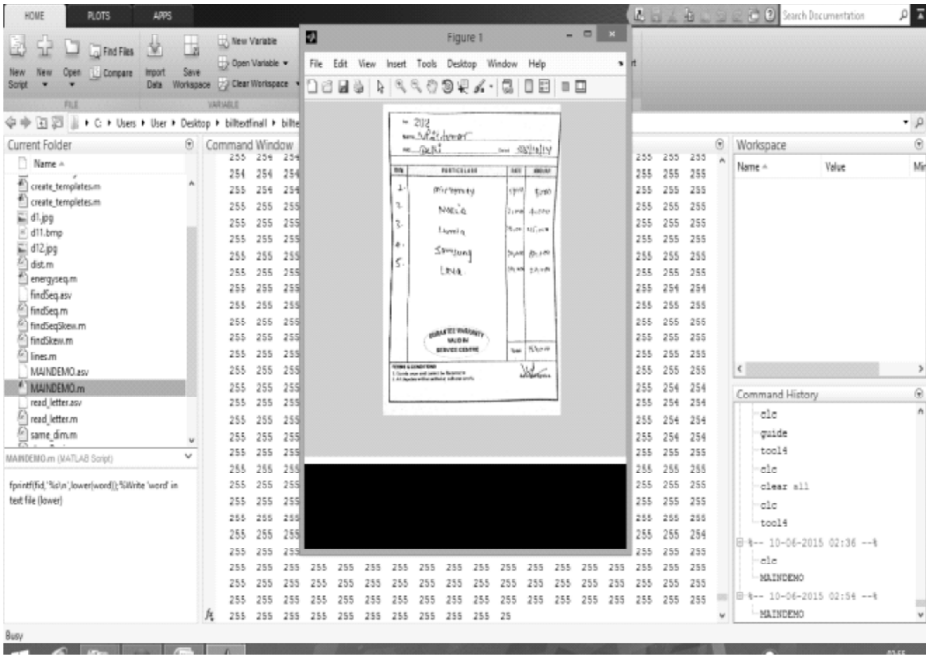

Figure 3.1: Bill Input

As illustrated in figure 3.1, the input image is loaded. This is the image of handwritten bill. The loaded image will be segmented and after applying the segmentation, image layout will be extracted and handwritten characters are extracted.

As illustrated in figure 3.2, the input image is loaded which is the image of handwritten bill. The loaded image will be segmented and after applying the segmentation, image layout will be extracted and handwritten

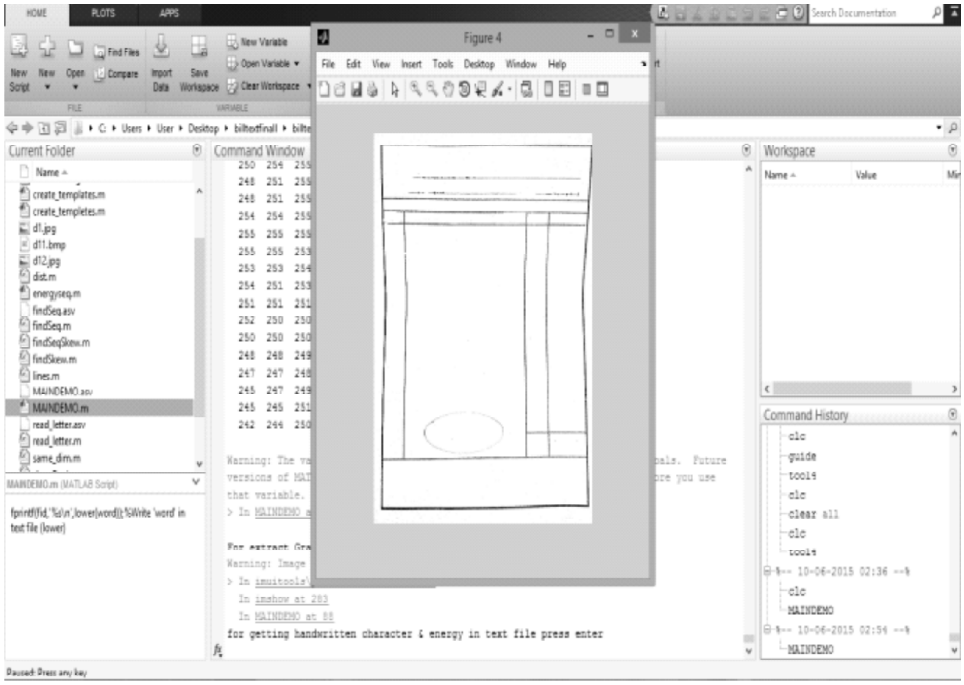

Figure 3.2: Layout Segmentation

characters are extracted. The handwritten characters are segmented by applying character wise segmentation. When the characters are segmented, then layout of bill is detected and it will segment according to the layout.

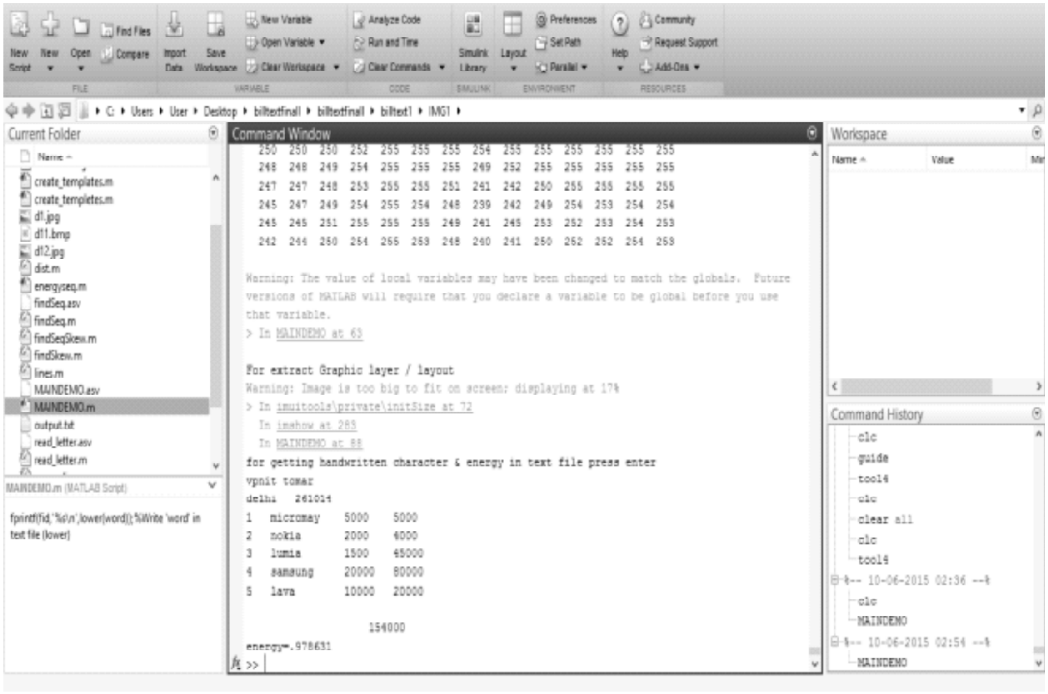

Figure 3.3: Handwritten Data Extraction

As illustrated in figure 3.3, the input image in loaded this is the image of handwritten bill. The loaded image will be segmented and after applying the segmentation, image layout will be extracted and handwritten characters are extracted. The handwritten characters are segmented by applying character wise segmentation. When the characters are segmented, then layout of bill is detected and it will segment according to the layout. The segmented characters will be detected which are in the handwritten bill and shown on the command window.

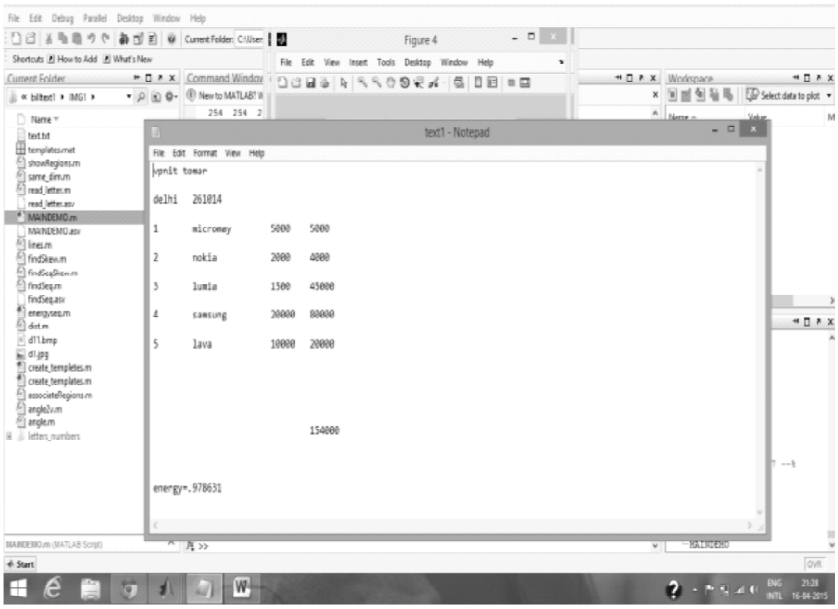

Figure 3.4: Data extracted in notepad

As illustrate in fig. 3.4 first of all, data extracted from handwritten documents. After that data sets values are shown in notepad.

4. CONCLUSION

Document segmentation is the crucial step of document image analysis .It plays a vital role as it is difficult to recognize the document image. As still there is too much work needed to be done in document segmentation. In the present work, detection is not based upon layout. So it is difficult to detect characters. So main aim is to apply layout detection. In this propose method for enhancing the way of carrying the document segmentation which contains the heterogeneous data is carried out and the segmentation technique is applied on the shopkeeper bills. In this approach the layout of bills is extracted and with the use of information energy we can calculate how much memory space is required and when the segmentation is carried out and the handwritten text are recognized, the recognized text are shown on the command window and then for the display of various parameters calculated, the output is shown on the notepad . To show the bill on to the command window and notepad for the further analysis make it the user specific approach.

In future, a technique will be proposed which saves handwritten character in different styles and printed characters on other file types.

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