Group -15
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OCR for Camera Based Handeled Devices

Our perpose is to design an app that extract text from an image. This application will convert scan or photo text images to an editable document.

Our project will consist Image processing and word recognisation . At first, text regions are extracted and skew corrected. Then, these regions are binarized and segmented into lines and characters. Characters are passed into the recognition module. Compared to Tesseract and other techneque it uses low Memory and applicable for handled camera devices.

Implementation :

Here are the following step we will use :

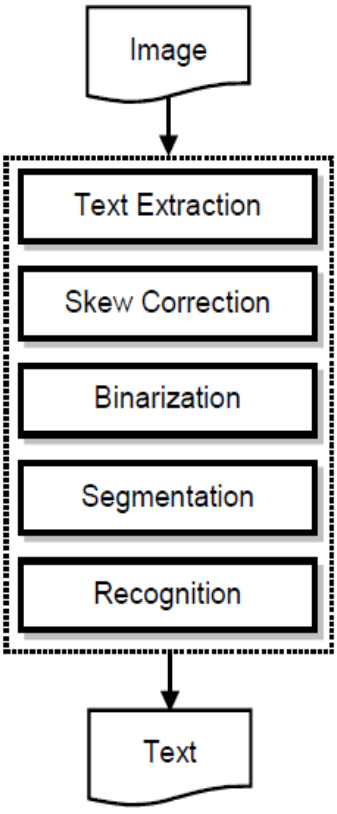

Fig. 1: Block diagram of the present system

Text Extraction :

We partition Input Image into some non-overlapping blocks (M) . Then based on Intensity variation we devide them into Background Block and Information Block .Then in Information Block using aspect ratio,pixel density and histogram we devide them into textual and non textual region.

Skew Correction :

In the Textual region there are two type of pixel : dark (text) and gray (background around text). Using one of the side as reference we calculate mean and first order moment and using them we calculate skew angle . At last we rotate by calculated skew angle.

Binarization :

Using the improved version of Bernsen's binarization method we binarize the skewed text region. In his method, we take the arithmetic mean of the maximum (G_{max}) and the minimum (G_{min}) gray levels around a pixel as the threshold for binarizing the pixel.

Segmentation :

For segmentation we use Histogram of a Binarized text region. We determine the line segments using thresholding profile value. Text line boundaries are referred by the values of i for which the value of fi is less than the threshold. Using vertical histogram profile of each individual text lines, words and characters are segmented.

Recognition :

We classify an individual binarized character by resizing the pattern by its bounding box, and normalized it to a standard dimension. Then using Templete matching we recognize the character.

References :

1. J. Bernsen, “Dynamic thresholding of grey-level images”, Proc. Eighth Int’l Conf. on Pattern Recognition, pp. 1251- 1255, Paris, 1986.
2. A. F. Mollah, S. Basu, M. Nasipuri, “Segmentation of Camera Captured Business Card Images for Mobile Devices”, Int’l J. of Computer Science and Applications, 1(1), pp. 33-37, June 2010.
3. Text/Graphics Separation and Skew Correction of Text Regions of Business Card Images for Mobile Devices ,Ayatullah Faruk Mollah, Subhadip Basu, and Mita Nasipuri.
4. Design of an Optical Character Recognition System for Camera-based Handheld Devices , Research Paper Ayatullah Faruk Mollah, Subhadip Basu, and Mita Nasipuri.
5. Handheld Mobile Device Based Text Region Extraction and Binarization of Image Embedded Text Documents, Research Paper , Subhadip Basu, and Mita Nasipuri.
6. Line Eikvil ,”Optical Character Recognition”, December 1993