Faculty of
Engineering
Credit Hours System

Cairo University

Pattern Recognition

“MILESTONE-1”

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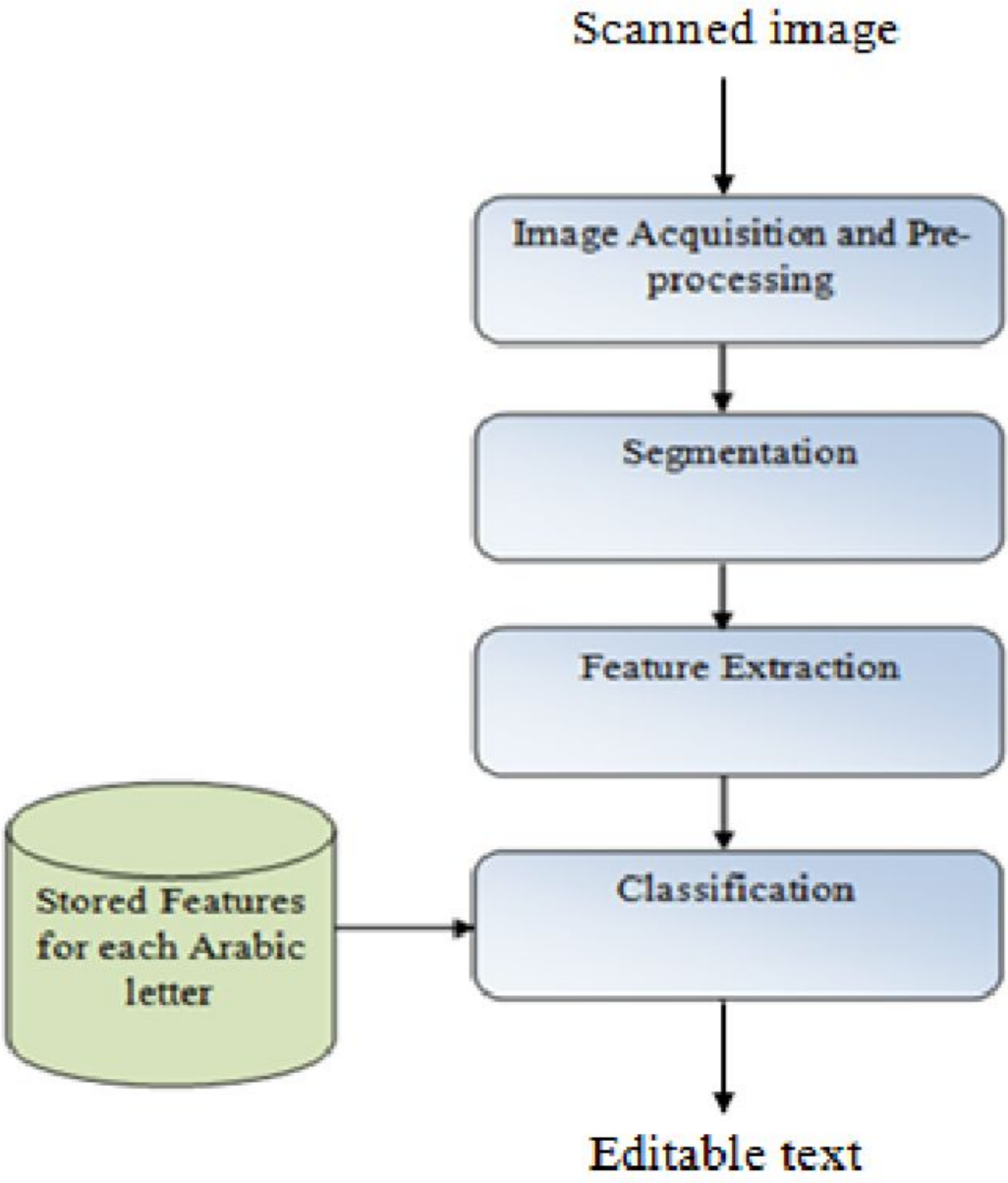
OVERVIEW

Optical character recognition or optical character reader (OCR) is the recognition process of text obtained from media in the form of typed, handwritten or printed text into machine-encoded text form. The text in question may be presented in the form of a scanned document, a photo of a document, a scene-photo or from subtitle text superimposed on an image.

Block Diagram

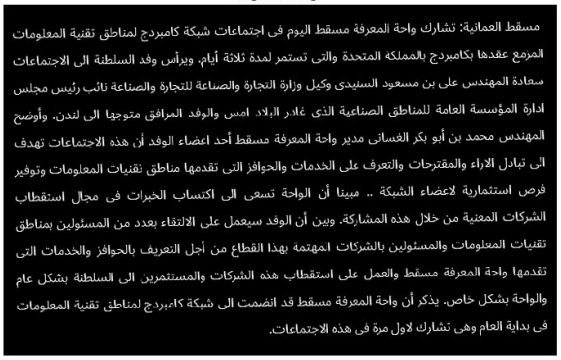


Block Diagram SPECIFICATIONS :

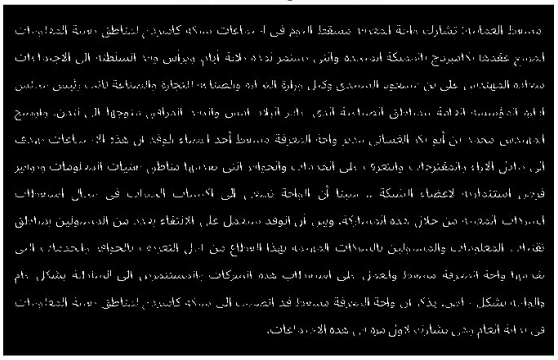
1- Preprocessing:

In preprocessing we calculate the skew angle if the scanned image is rotated and fix it and apply Otsu's thresholding method to convert the scanned image to binary image

Orignal Image



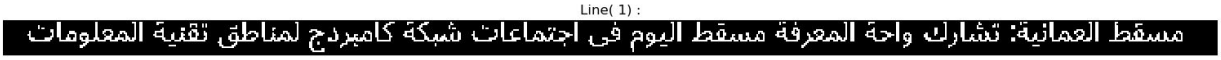
After Threholding And rotation



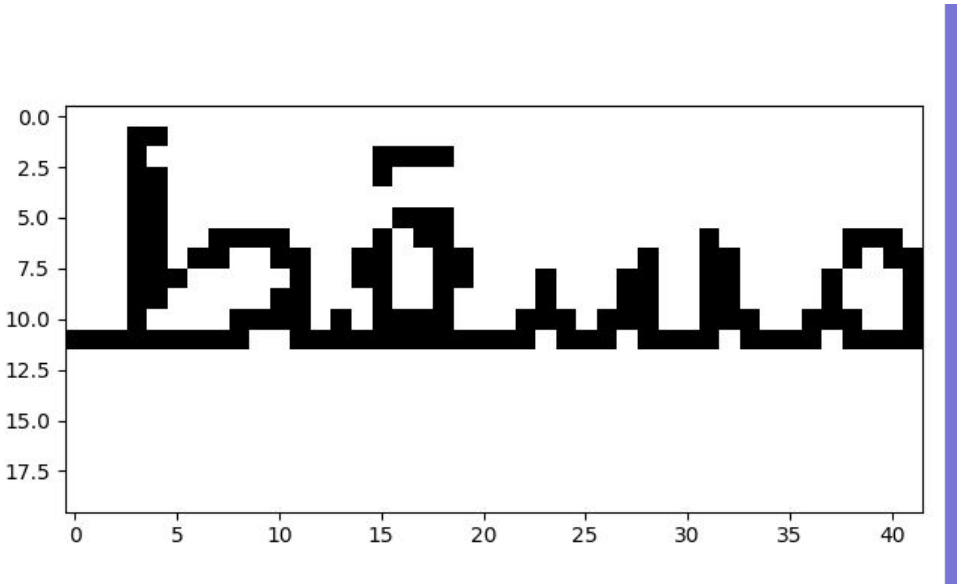
2- Segmentation:

Line Segmentation: we make a horizontal projection and detect the gaps and form the gaps we segment the lines

Line(1) :



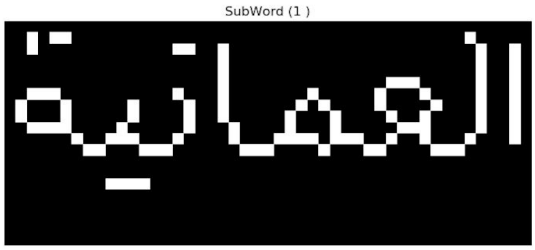
Word Segmentation: after we segment line into separate words by using connected component and merge the components into separate words

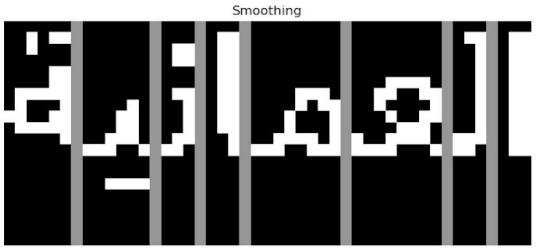


CharacterSegementation: First we detect both baseline (making horizontal projections and sum each row and pick the most one) and we detect the Maximum transition line(we count in each row the transition from black to white and pick the row index with maximum transition)

We use the Maximum transition index and iterate on each col and if the transition is detected

We calculate the start and end index as from black to white and from white to black is my end index and then we choose a cut between them





3- Feature Extraction:

We choose those features:

1. Number of connected components
2. Number of holes
3. Height to Width ratio
4. Max transition columns
5. Max transition Row

4- Classification

After we train our model and making a dataset we choose a Naive Bayes classifier or KNN (not done yet)

References

1. Optical Character Recognition of Arabic Printed Text Safwa Taha, Yusra Babiker, and Mohamed Abbas
2. https://en.wikipedia.org/wiki/Naive_Bayes_classifier
3. Printed Arabic Optical Character Recognition using Support vector machine