Analysis on Text Detection using Augmented Reality

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Abstract: *Augmented Reality (AR) is an enhanced version of reality where live direct or indirect views of physical real-world environments are augmented with superimposed computer-generated images over a user's view of the real-world, thus enhancing one's current perception of reality. Text Detection is very useful in day to day life as it make easy to write and understand text by just using the Smart Phones. In this Dissertation Presentation, we are going to improve the Optical Character Recognition (OCR) for better performance, as OCR is responsible for text detection. Here we are going to develop new or improve text detection algorithm for Optimal Path Selection and Hand written text to make it more flexible on natural images and recognize texts with other informative contents Using Augmented Reality for Android-Based Smart-Phones.*

Keyword: Augmented Reality; Optical Character Recognition (OCR); Text Detection.

I. INTRODUCTION

Augmented Reality (AR) is a general term for a collection of technologies used to blend computer generated information with the viewer's natural senses. Since mobile 'smart' devices have become ubiquitous, 'Augmented Reality Browsers' have been developed to run on them.[11] AR browsers utilize the device's sensors (camera input, GPS, compass, et al) and superimpose useful information in a layer on top of the image from the camera which, in turn, is viewed on the device's screen. [11] It is estimated that 2.5 billion AR apps will be downloaded annually and will generate revenue of more than $1.5 billion by 2015. This is because AR apps will not be limited to conventional mobile apps. There will be new markets like Google Glass which will open more forms of development and use.[12] AR is helpful in development of translation apps that can interpret text in other languages for you. Location based AR apps are major forms of AR apps. Users can access information about nearest places relative to current location. They can get information about places and choose based on user reviews.[13]

II.INTRODUCTION TO TEXT DETECTION AND OCR

Optical character recognition (also optical character reader, OCR) is the mechanical or electronic conversion of images of typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo or from subtitle text superimposed on an image.Widely used as a form of information entry from printed paper data records – whether passport documents, invoices, bank statements, computerised receipts, business cards, mail, printouts of static-data, or any suitable documentation [15]

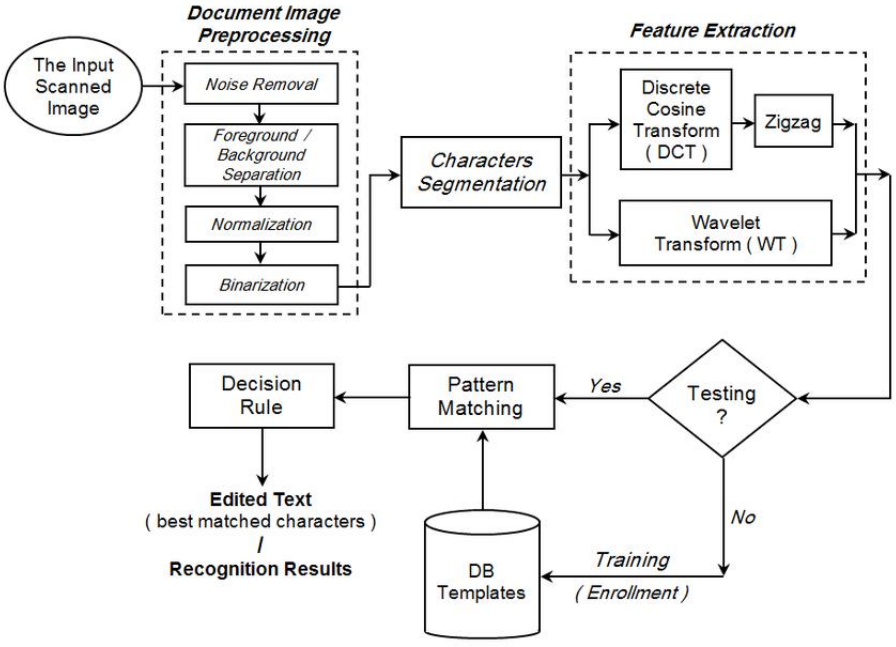


Fig. Block-Diagram of the Proposed OCR System Model[14]

TECHNIQUES:

1. Pre-processing.
2. Character Recognition.
3. Post- processing.
4. Application-specific optimizations.
5. HMM Approach
6. Neural community technique
7. Character Normalization

III.LITERATURE SURVEY

A. RELAVANCE SURVEY ON TEXT DETECTION USING AUGMENTED REALITY

In this paper [1] they have presented a novel text-based AR frame- work that performs OCR on natural images and replaces recognized texts with other informative contents they implemented conventional text detection and recognition blocks, and developed an augmentation algorithm for the realistic replacement. augmentation block consists of (a) background reconstruction based on linear interpolation and (b) new text insertion considering the original text color and geometric distortions.

In this paper [2] presented approaches for building robust and efficient models for text detection and recognition, and discussed architectural approaches for building a scalable OCR system Rosetta. With thorough evaluation, as well as demonstrated trade-offs between achieving high efficiency in terms of scale and processing time and the accuracy of models. system is deployed to production and processes images uploaded to Facebook everyday.

This paper [3] they introduced a complete workflow for text extraction and retrieval from smartphone screenshots. The pipeline is based on OpenCV image-processing and Tesseract OCR modules. they evaluated the quality of the extracted text, and showed how word and character accuracy improved through refinement of image preprocessing procedures and NeuralNet based line-recognition system introduced in the newly released Tesseract 4.0. Detailed analysis of word and character errors suggest that further improvements are possible, both generally and in the data production process.

In this paper [4] have proposed a relatively simple cascaded text detection system that is accurate at the pixel, character and word levels, and produces state-of-the-art performance on a challenging dataset. Contextual features, a coarse-to-fine detection strategy, and using greater visual detail to define targets in later stages help improve sliding window-based character detection. Character detection is cascaded with multiple validation steps, culminating in detected words providing contextual constraints at the final detection stage.

This paper [5] they have presented a text detection method that combines with an image rectification. Although in the text detection, prior information given by user is employed, in online use, this is the easiest way to detect the desirable text area stably. Foreground components are stably extracted, using the reference pixel as the priors.

In text structure analysis, the underlying problem is equal to a graph cut problem. The foreground component that includes the reference pixel corresponds to the root node of the sub graph. Although it is a custom of long standing in image understanding problem, the constructed graph is a kind of scene descriptors. After text detection process, image rectification is applied for the extracted text area.

B. Comparison table

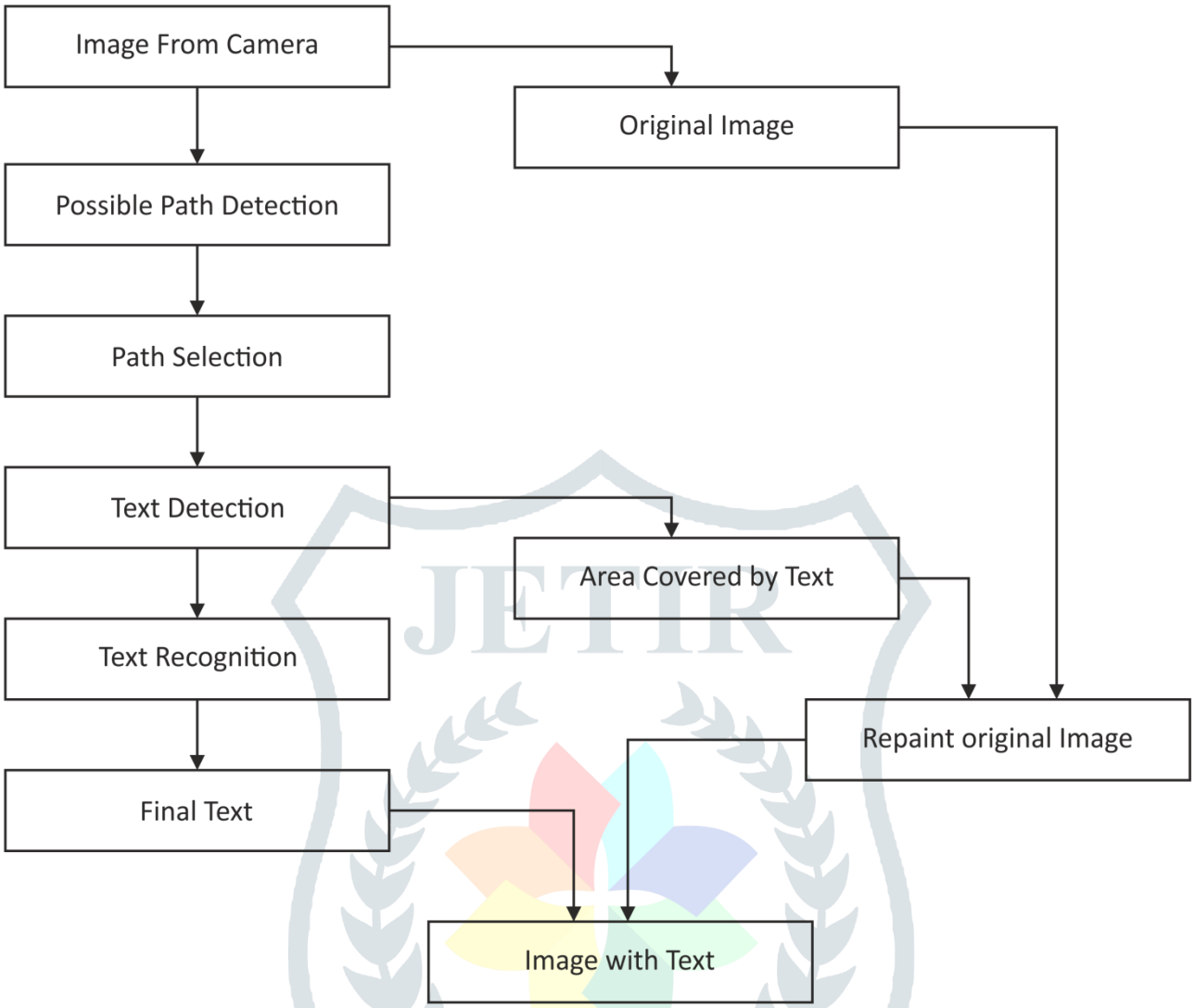
Sr. No.	Paper Title	Method Used	Advantages	Disadvantages
1.	Fast and Simple Text Replacement Algorithm for Text-based Augmented Reality.[1]	OCR, Conventional Text Detection Algorithm, Inpainting Algorithm	New Text over the Same Image	Unable to detect the sentence if there any extra space or unrecognized symbol
2.	Rosetta: Large Scale System for Text Detectionand Recognition in Images[2]	OCR, Faster-RCNN	Text Processing and Background Processing with same algorithm.	Unable to detect the sentence if there any extra space or unrecognized symbol as well as slow

3.	Text Extraction and Retrieval from Smartphone Screenshots: Building a Repository for Life in Media [3]	OCR, Tesseract	Text Detection from Smartphone screenshots.	Works only on perfect Images .
4.	A Text Detection System for Natural Scenes with Convolutional Feature Learning and Cascaded Classification [4]	OCR, Adaboost Algorithm	Training Samples are Used to Detect text on Original Image	A bit complex methodology.
5.	A method for Text Detection and Rectification in Real-world Images[5]	OCR, Text Detection , Image Rectification	Text detection and Image Rectification are carried out seprately	Processing time is high., Lots of Error,

Table 1: Comparative Study

IV.PROPOSED WORK

Problem Defination : According to the literature survey there are certain limitations regarding the text detection there are some factors that plays a big role in text detection, The Curve in word and Break-line of sentence, as it's quite difficult to detect text with a different Path



PROPOSED SYSYTEM

Steps of Flow chart

Step 1: Get Image from Camera

Step 2: Detect all possible Paths

Step 3: Select one Path

Step 4: Text Detection using Conventional Text Detection Algorithm

Step 5: Text Recognition

Step 6: Final Text

Step 7: Repaint Image using Inpainting Algorithm

Step 8: Final Image with Final Text

V.CONCLUSION

The Proposed Text Detection technique is very helpful to detect text with abnormal paths, It may take more computational time due to it's working flow.

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