**TXT Scan**

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Submitted to: Mrs. Sugandha Sharma

Submitted by: Harneet Singh(16BCS1624)

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Chandigarh University, Gharuan**

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**Abstract**

Data entry has been a hectic job since the era of data accumulation started. Apparently, that is why there is a full-fledged career in data entry. Data entry method varies with requirements. Early days of computers relied on punch cards and gradually keyboards and mouse came into picture which we still use. Touchscreens didn’t take much time to replace the physical keyboard inputs and now as the result of human intelligence and innovation, the era of the optical input is here. Where the user does not even have to take the pain of thinking about entering data but can simply use an optical reader or scanner to input data. Using the computational power the individual elements like text, images, and special characters can be distinguished. OCR-Optical Character Recognizer does the work. OCR works similar to humans when it comes to character recognition as it maintains a database of characters and compares all the scanned elements with the database which makes it really simple to understand. This paper explains the working of an OCR in its different stages. That study helps in finding the various drawbacks of the conventional system. The paper also tells about how those shortcomings can be eliminated and how a better OCR that is future ready can be achieved.

**Modules of an OCR system**

* *Pre-Processing*:

As the very first step of using OCR system the camera or scanner or any other optical input device clicks a picture or the document then converts that picture to grayscale popularly Black and White. While doing so it removes all the extra things like images, logos, lines and dust particles or stains on the page or document if any, it converts any shades or colors of black or grey to just black and white leaving a more clear picture which just has text on it in black and white color [3].

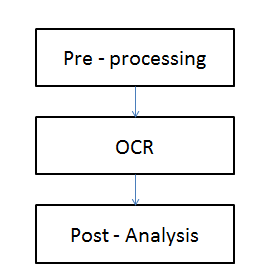


Figure 2. Workflow outline of OCR System

* *Character Recognition:*

The pre-processed image is then taken for character recognition where the individual characters on the captured image are separated.

This is the point at which OCR systems are primarily distinguished. OCR’s can do this in two ways:

* Examining resemblance with characters in database:

In this method of character recognition pixels of individual characters are compared with a database of a known font which helps the system decide which character it is.

This system has a limitation too. The database comparison method isn’t able to recognize the words that are in a different font or are written by hand in some cases as not everybody on this planet has the same yet perfect handwriting.

* Intelligent character recognition system:

This system overcomes the shortcomings of simple yet not so useful method of comparing with a database of a known font.

The Intelligent character recognition system compares the attributes like curves, angles, sizes, corners of characters on the pre-processed image with the template of characters. The template with the maximum number of matched character is considered to be the character on the image. In this way whatsoever the font type or size is the OCR system will be able to recognize the characters

The intelligent system was improved by adding a dictionary to it. So that it not only recognizes characters out of the pre-processed images but also just picks up the meaningful words out of those characters .

E.g. ‘I’ and ‘l’ might seem similar but the first one is capital ‘I’ and the other one is small ‘L’. Using dictionary system can make out if it is ‘LOOK’ or ‘IOOK’.

Note: This document primarily focuses on the 1st type of system.

* *Post Processing:*

Once the characters are recognized and words are formed at the logical level the system prepares the document in the desired form whether it be an image, pdf or text file. The point that is to be noted is that the final document is yet to be displayed to the user so post-processing should not be considered as the final output of the system.

* *Output*:

After passing through the post-processing stage the input image gets converted into a document, image or a PDF depending upon the type of OCR system used or the user’s requirement.

Depending upon the type of OCR used the output might or might not be in formats where editing can be done (Text document) or not.

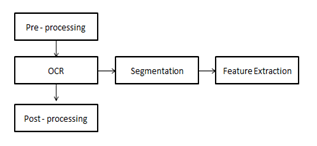


Figure 3. Standard OCR character recognition steps

* *Proofreading*:

Once the entire process of conversion is completed the output needs to be verified as no matter how much the OCR’s have advanced there is always a chance of some error. This thing applies to almost all the things when it comes to dependency on technology. Especially when it comes to paperwork or documents it becomes necessary that it is cross-checked with human eyes [2].

**HARDWARE AND SYSTEM REQUIREMENTS.**

* **HARDWARE REQUIREMNTS**
* Laptop with internet connectivity
* Mobile
* **SYSTEM REQUIREMNTS**
* Android OS
* Android studio
* notepad
* Emulator

**Conclusion:**

This paper tells about the OCR system functioning by breaking it down into steps, which helps in identifying the loops in the current method of character recognition. The system is capable of giving some really commendable results but there are certain things that require revision and needs improvement. Those improvement methods are listed in the documents. Implementing the suggested techniques can take the level of character recognition to next level.

Future researches aimed at OCR can be directed in the zone of “ML & AI”. Researches focused in these fields can increase the precision level of system and handwriting of no matter who it is? Or How bad or good the writing is? Using the same research on ML and AI security features can be implemented where no official documents like driving license, atm card, ID card etc will not be read or a watermark or some patch could be added to the output.

**REFRENCES**

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