

Robust Assistive Reading framework for Visually Challenged

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Abstract— The Main objective of this assistive framework is to communicate the textual Information in the image captured by the Visually Challenged person as Speech, So that the Visually Challenged person can acquire knowledge about the surrounding. This framework can help Visually Challenged person to read books, magazine, warnings, instructions and various displays as well by taking their image along with the surrounding. Then the Optical Character Recognition (OCR) extracts and recognizes the text in the image and generates the text file. This text file is further converted to Speech with the help of Text to Speech (TTS) Synthesis. The inherent problem with the previous approach was if the acquired image is affected with the issues of different lighting conditions, noise and issue of Skew and Blur, as the image is captured by Visually Challenged person. Then the overall accuracy of the system was at stake due to inefficient OCR leads to improper Speech output of TTS Synthesis. In this paper we have introduced two more processes that are deblurring using Blind Deconvolution method and Pre-processing operation to remove the effect of noise and blur. Thus it prepares the image for efficient result of the framework for Visually Challenged. The proposed approach is implemented in Matlab with the image captured manually and taken from the internet and the result along with the OCR text file and corresponding output Speech shows that our framework is better than the previous framework.

Index Terms—Assistive framework, Visually Challenged, Optical Character Recognition, Text to Speech, Deblurring and Matlab.

I. INTRODUCTION

A lot of text information can be extracted from the images of the Surrounding Environment having text. The Surrounding having text information are name plates having the name and address of the individuals outside their residences, Boards containing the name of street, Area and distance, Various sign board and warning boards and the diversion boards are embedded with text,

we also see various displays at airports, railways and shopping malls and most of the text is found in the magazines, newspaper and books. So in our day to day life we are surrounded by text which we see from our eye and then we acquire the knowledge based on this textual information. For instance if we are searching for an address and we find a name plate of the same address outside a residence then we are sure that we have found the correct address. Hence textual information plays a vital role in our life. On the other hand if we think of a person which is Visually Challenged he cannot acquire the knowledge of the surrounding whether it be a warning sign, name of street and various types of displays because he cannot see these things. With the advancement of the Information Technology we have thought of the solution to this problem [1] can be with the help of Image Processing and Signal Processing using Optical Character Recognitions and Text to Speech conversion.

A. Input Capturing by Visually Challenged

Image of the text can be taken either with the help of a scanner or with the help of a portable camera or smart phone camera. In today's era with the advent of technology we have high resolution portable camera with many features such as autofocus, wide angle and high picture clarity it is easy to capture text with clarity. If the text in the captured image is clear then its segmentation and recognition [2] will be efficient and overall accuracy of the system will be high. But for a Visually Challenged person to capture the image with the help of a portable camera and with clarity will be a herculean task. We have assumed that the image captured by the Visually Challenged will be affected with the issues of Blur [2] and skew [3]. Problem associated with the Scanner is that for Visually Challenged person, it is difficult to place a