BLIND BOOK READER IMAGE TEXT TO SPEECH CONVERSION IN THE DESIRED LANGUAGE

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Abstract- **In the survey Indian Foundation for Blind 2019, is observed that there are 6.8 trillion people are visually impaired and they still find difficult to roll their day today life it is important to take necessary measure with the emerging technologies to help them to live the current world irrespective of their impairments. In the motive of supporting the visually impaired, a method is proposed to develop a self-assisted text to speech module in order to make them read and understand the text in an easier way. It is not only applicable for the visually impaired but also to any normal human beings who are willing to read the text as a speech as quickly as possible. A finger mounted camera is used to capture the text image from the printed text and the captured image is analysed using optical character recognition (OCR). A predefined dataset is loaded in order to match the observed text with the captured image. Once it is matched the text is synthesized for producing speech output. The main advantage of proposed method is that, it reduces the dataset memory required for the comparison since only character recognition is being done. The same work is simulated using Python simulator software for the performance analysis of proposed work for various input sets.**

1.INTRODUCTION

1.1 Introduction of Project

The growth of the Internet, and in particular the World Wide Web, is already influencing the way science is taught and will undoubtedly do so to greater extent in the future. In areas of education it offers a medium that has the potential to be more responsive to students. To encourage greater participation in their own learning, and to give greater access to different sources of information than traditional methods offers. In the future blind peoples also can do online exam like a normal human if our project is delivered in real time. For the Supervising Faculty: Marking the test is done automatically and instantaneously; the faculty is relieved from these, time consuming duties.

Scope of the project

Vehicle number plate recognition (VNPR) system is a digital image processing techniques which is broadly used in vehicle transportation system to identify the vehicle by their number plate. Yet it's a very challenging problem, due to the diversity of plate formats, different scales, and non-uniform illumination conditions during image acquisition. This research mainly focuses on Nepali vehicle number plate recognition system in which the vehicle plate image is received by the digital cameras and the image was then processed to obtain the number plate information. A real image of a vehicle is captured and processed using various algorithms. Morphological operations, and edge detection, smoothing, □ltering, techniques for plate localization and characters segmentation for segment character and these segmented character was cut in to block of 70×70 size and calculate the correlation with the template of database using the template matching algorithm normalized cross correlation and phase correlation and compare this result in term of accuracy. The system was tested by 90 patterns under several conditions. It includes experiment of number plate recognition using phase correlation and normalized cross correlation methods. From the study and analysis of test after applying on number of images of database, the normalized cross correlation method was found more accurate to recognize the number plate then phase correlation method and recognition accuracy of normalized cross correlation was 67.98% and phase correlation was 63.46%

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Virtually people who could restore normal vision with eye glasses or contact lenses are around 20% from the survey of ABF (www.abf.com) who could lead their normal lives. Apart from them 90% of world`s visually impaired people who live in low, middle and even in most developed countries, cataract remains the leading cause of blindness. Accessing text documents is

troublesome for visually impaired people in many scenarios, such as reading text on the go and accessing text in less than ideal conditions. The goal is to allow blind users to touch printed text and receive speech output in real-time. The user`s finger is guided along each line via haptic and non-verbal audio cues. The following are the scope of our project.

1. To design a good accuracy rate in translating from image to voice.
2. Should be applied to all books and images.
3. Low time consumption.
4. User friendly model.

2. LITERATURE REVIEW

2.1 "Reduced Left Lateralization of Language in Congenitally Blind Individuals", - S. A. Chiappini, D. J. Kormes, M. C. Bonetto, N. Sacco, and E. Cortòn IEEE 2021.

Language processing depends on a left-lateralized network of frontotemporal cortical regions. This network is remarkably consistent across individuals and cultures. However, there is also evidence that developmental factors, such as delayed exposure to language, can modify this network. Recently, it has been found that, in congenitally blind individuals, the typical frontotemporal language network expands to include parts of "visual" cortices. Here, we report that blindness is also associated with reduced left lateralization in frontotemporal language areas. We analyzed fMRI data from two samples of congenitally blind adults (n = 19 and n = 13) and one sample of congenitally blind children (n = 20). Laterality indices were computed for sentence comprehension relative to three different control conditions: solving math equations (Experiment 1), a memory task with nonwords (Experiment 2), and a "does this come next?" task with music (Experiment 3). Across experiments and participant samples, the frontotemporal language network was less left-lateralized in congenitally blind than in sighted individuals. Reduction in left lateralization was not related to Braille

2.2 "Development of a computer-aided system for automating production of tactile maps and its usability evaluation", - M. Grossi, M. Lanzoni, A. Pompei, R. Lazzarini, D. Matteuzzi, and B. Riccò IEEE 2021.

Tactile graphics are images that use raised surfaces so that a visually impaired person can feel them. Tactile maps are used by blind and partially sighted people when navigating around an environment, and they are also used prior to a visit for orientation purposes. Since the ability for reading tactile graphics deeply depends on individuals, providing tactile graphics individually is needed. This implies that producing tactile graphics should be as simple as possible. Based on this background, we are developing a system for automating production of tactile maps from hand-drawn figures. In this paper, we first present a pattern recognition method for hand-drawn maps. The usability for our system is then evaluated by comparing with the two different methods to produce tactile graphics.

2.3 "Get only the essential information: Text summarizer based on implicit data" Deepak Kumar Lodhi1 , Prakshi Vats , , Ritakshi Gupta1 , , Rajat Butola IEEE 2021.

The need for a tool that takes a text and shortens it into a brief and succinct summary has never been greater than nowadays. With the huge amount of information on the internet and the necessity to get the essential of this information in a short time, the need for summarizers becomes everyday pressing, especially, for people with special needs like blind or elderly people. For those people it is vital to go directly to the essential information rather than having to read through many passages. So far and trying to reach human capabilities, research in automatic summarization has been based on hypothesis that are both enabling and limiting.

3.1 Existing system

Random Forest (RF):

Random forests or **random decision forests** are an ensemble learning method for classification, regression and other tasks that operate by constructing a multitude of decision trees at training time and outputting the class that is the mode of the classes (classification) or mean/average prediction (regression) of the individual trees. Random decision forests correct for decision trees' habit of over fitting to their training set. Random forests generally outperform decision trees, but their accuracy is lower than gradient boosted trees. However, data characteristics can affect their performance.

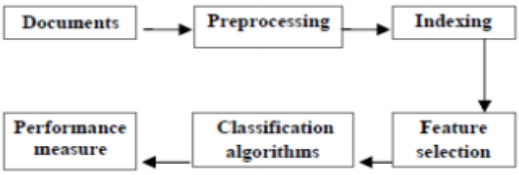
3.2.2 Proposed system

Convolution Neural Network:

In deep learning, a **convolutional neural network** (**CNN**, or **ConvNet**) is a class of deep neural networks, most commonly applied to analyzing visual imagery. They are also known as **shift invariant** or **space invariant artificial neural networks** (**SIANN**), based on their shared-weights architecture and translation invariance characteristics. They have applications in image and video recognition, recommender systems, image classification, Image segmentation, medical image analysis, natural language processing, brain-computer interfaces, and financial time series.

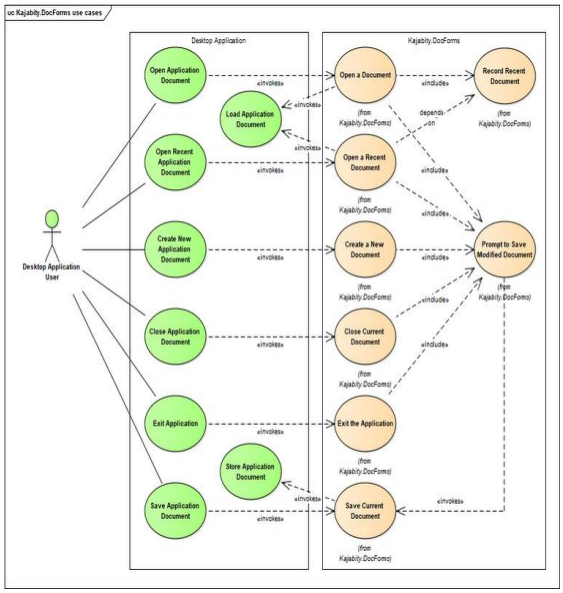
CNNs are regularized versions of multilayer perceptrons. Multilayer perceptrons usually mean fully connected networks, that is, each neuron in one layer is connected to all neurons in the next layer.

3.3 SYSTEM ARCHITECTURE



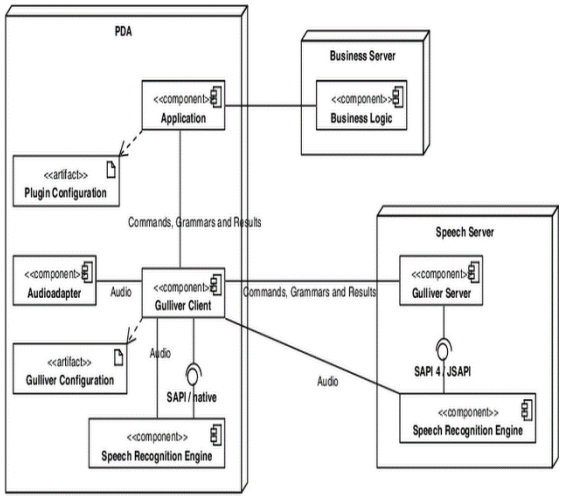
4. UML DIAGRAMS

4.1 Use case Diagram

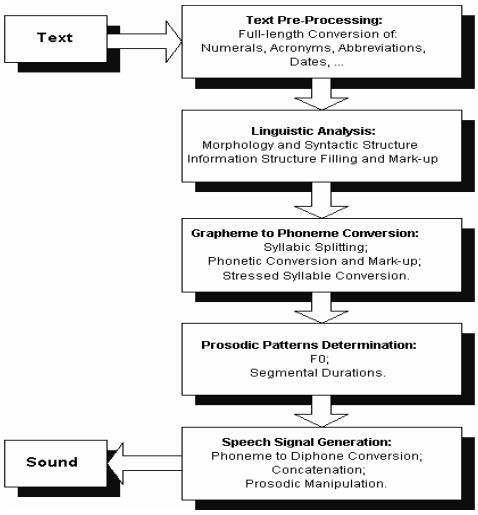


4.2 Class Diagram

4.3 Deployment Diagram



4.4 Component Diagram



5. COMPARATIVE STUDY OF EXISTING AND PROPOSED SYSTEM

In existing system we will be using edge detection technique. In this technique we will be using the concept of only edge detection algorithm. Here only the edges of the characters or numbers will be cropped. The main drawback of this system is since only the edges are been taken into account we will less let accuracy in predicting the numbers and characters. In our proposed system we will be using the concept of OCR which will find all the characters correctly so accuracy in finding the numbers is good. In existing system we will have only English voice as output whereas in our proposed system we will get output voice as per our naïve language. Here we will be using two algorithms for classification one is Random Forest (RF) and Convolution Neural Networks (CNN).

6.SYSTEM STUDY

FEASIBILTY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

7. CONCLUSION AND FUTURE SCOPE

7.1 Conclusion

Currently we have proposed the OCR algorithm for our proposed system. In future we would implement this system on library with some another algorithm and would also do the performance check of the system designed. We would do the performance analysis in terms of image to voice successfully. So far the algorithms looks good and suitable but if the OCR algorithm won't work than we will try to give some new algorithm or would do the comparative study of different OCR present in the market and would try to choose the best among them and implement the system.

7.2 Future Scope

In future we can do implementation of neural network using the feed-forward back propagation algorithm. The parameters of the neural network were optimized to enhance the performance of the neural network.

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