A Survey on Text Recognition and Face Identification for Visually Impaired

Dr. I Ambikai[1], Rudrakshi Tiwari[2], S Sai Ashwin[3], S Sanathan Karthik[4], Sabah Alia R[5]

[1]Associate Professor, Department of Computer science and engineering, MVJ College of Engineering, Bangalore, Karnataka, India.
[2,3,4,5]Undergraduate Scholar, Department of Computer Science and Engineering, MVJ College of Engineering, Bangalore, Karnataka, India.
[1] ambika@mvjce.edu.in,[2]rudraksshi@gmail.com, [3]saiashwin3007@gmail.com, [4]sanathankarthik26@gmail.com, sabahalia1257@gmail.com

A B S T R A C T

Today, visual information is the most important information, so blind or partially sighted people are at a disadvantage because the mandatory avoidable information is not available to them. The aim of this project is to skillfully guide the visually impaired. This system is designed for them to solve an impossible situation affecting blind people. Our system introduces an automatic system that allows them to read text patterns printed on documents. Text patterns are localized and binarized using OCR. The identification text is converted to sound and given to the user. So deal with character recognition. Difficulty recognizing people during a conversation is a huge disadvantage for these people in many professional and constructive situations. To increase the accuracy of facial recognition, these devices use smartphones, we have an archetype, and facial recognition is tested on end users. This system uses a speech-to-speech module to produce sound for the blind.

Keywords: Alcohol-detecting systems, Risk Analysis, MQ-3 sensor, Blood Alcohol Content (BAC), Breath Alcohol Concentration (BrAC), Optimizable Shallow Neural Network (O-SNN), Virtual Instrumentation Software Architecture (VISA), NI LabView, Gabor Filter.

1. Introduction

Low vision means less vision, either total or partial blindness. Blindness cannot be completely solved by glasses or contact lenses. Loss of sight is another way of losing independence. Reading is an integral part of our society. Reading a text provides a lot of information about our lives and helps us navigate. The text can be anything, such as a report, a receipt, a product package, even a restaurant receipt, etc.

Reading a text document is a difficult task for the visually impaired. Sometimes a document needs to maintain privacy, such as a bank document, tax invoice, letter, etc. that people do not want others to read. But due to vision loss, people have to use other aids to read personal documents.

From this point of view, the system needs to recognize the text based on the text and symbol data, and identify the text character from the text image of the captured scene, and the last text or symbol data is converted into a voice message. Some algorithms are used to extract text information from image and text recognition.

Converting a landscape image to a text texture is a difficult task due to the special pixel level, non-text background outline and different foreground style and size. So the scene text extraction process has two parts as OCR and OCR. For face recognition, the system should be able to recognize a face using an image and identify a person's name in the training data

2. Literature Review

2.1 Object detection combining recognition and segmentation

We combine top-down popularity with bottom-up picture segmentation to expand an item identification technique. This method has two main steps: a speculative technology phase and a verification step. We design an improved Shape Context feature in the top-down speculation technology phase, which is more resistant to item deformation and history clutter. The advanced Shape Context is used to construct a set of hard and fast hypotheses for item locations and figure floor masks with high recall and accuracy rates. In the verification stage, we compute a hard and fast list of potential segmentations that are consistent with top-down item assumptions, and then recommend using the False Positive Pruning (FPP) technique to prune out fake positives. We take use of the fact that fake-high-quality regions no longer correspond with any photo segmentation. Experiments show that this simple framework can achieve both high recall and high accuracy with only a few high-quality teaching examples, and that this method can be applied to a wide range of item classes.

2.2 Review paper on facial recognition for visually impaired

In today's ever-changing world, everything is changing to achieve a better life for humanity. New developments make it possible. Therefore, we decided to develop a real-time facial recognition system. Automatic facial recognition and tracking systems are becoming increasingly important as they are required for CCTV and new user interfaces. This ensures greater security for the nation. This system works for everyone, but some people get hurt by acid attacks and wars. So we wrote code for those people. It works and offers solutions to many problems. The system is developed using C#. Network programming, ViolaJones algorithm (Haar cascade classifier), PCA (feature and image dependent), EmguCV (OpenCV computer vision library and cover chapters).

2.3 A review paper on facial recognition for visually impaired people

Informing people correctly and effectively has been a hot topic in academia and industry. Also, with the rapid improvement of synthetic intelligence, the popularity of faces has gained more and more attention in recent years. Compared with the popularity of traditional card, popularity of fingerprint and popularity of iris, popularity of face has many advantages, which are intangibility, excessive simultaneity and consumer friendliness. It has excess capacity to be used in government agencies, public facilities, security, e-commerce, retail, education and many different fields. Deep information service is one of the new and important fields of information service. Deep data mining refers to algorithms that solve many problems, including snapshots and texts, using many systems that receive information from multi-layer neural network algorithms. Deep knowledge acquisition can be classified as a general category of neural community, but there are many variations in the specific application. Deep knowledge acquisition is characterized by knowledge acquisition that aims to gather hierarchical statistics over hierarchical networks to discover important items that previously required synthetic layout operations. Deep learning is a framework that contains several important algorithms. For certain applications (snapshots, audio, text), you'll want to implement some community modes for better results. With the acquisition of knowledge of deep convolutional neural networks and the introduction of deep convolutional neural networks, the accuracy and speed of face recognition has risen to a high level. However, as we noted above, the results for certain networks and modes are very specific. This paper extracts facial features by combining and evaluating a pair of modes, and then builds a deep neural network to learn and collect the blended features. In this way, the merits of four fashion pairs can be mixed according to the accuracy of popularity. Upon receiving an overly accurate version, we will create a production version.

2.4 A Study of text detection and recognition.

A text is a system of symbols used to capture, communicate or transmit culture. As one of the most influential inventions of mankind, text has played an important role in human life. In particular, rich and accurate semantic information conveyed by text is important in many vision-based applications. With the rise and development of deep learning, computer vision has undergone major changes and changes. As an important field of computer vision research, scene text detection and recognition has become inevitable. Under the influence of this revolutionary wave, it entered the era of deep learning. In recent years, the community has seen significant advances in thinking, methodology and efficiency. The aim of this work is to summarize and analyze the most important changes and developments in scene text identification and recognition in deep learning.

2.5 Text detection and recognition : A review.

This article identifies and compares the different steps in the text recognition and recognition process and analyzes the different approaches used to extract text from color images. Two methods are often used to solve this problem: stepwise methods and integrated methods, while this task is divided into text detection and localization, classification, segmentation and text recognition. This article presents the major approaches used to accomplish these steps, along with their advantages, disadvantages, and applications. Various image applications related to text are also introduced here. In this review, a comparative analysis of the main processes in this field is made.

2.6 A review on text recognition for visually blind people

The paper has proposed a technique where Nowadays text recognition is an essential problem for visually impaired peoples. Text-to-speech (TTS) is the generation of synthesized speech from the text. This paper presents a survey on text detection and the conversion of text to speech. There have been many methods for detecting text in past work. This paper reviews the techniques of different methods for text recognition.

2.7 Text detection system for the blind

In this paper, a system that can locate and read aloud text embedded in natural scene images can be very useful for the blind and visually impaired - providing useful information in everyday life, increasing their confidence and autonomy. Although currently available optical character recognition (OCR) programs are fast and accurate, most of them cannot recognize text embedded in nature scene images. The purpose of the algorithm described in this article is to find text-like image areas and pre-process them in such a way that OCR is more reliable. The approach described in the article is based on color image segmentation and segment shape analysis. Preliminary tests have shown that the proposed algorithm provides a satisfactory recognition rate and is quite robust to typical text distortions such as waving, tilting and bending

2.8 Text recognition system for visually impaired

This recognition of paper text in natural and complex images plays an important role in image analysis. Textual information appears everywhere, such as product labels, documents, scene images, etc. It is very difficult for the visually impaired to find the text area in the image. This problem needs to be solved because it cannot assume that the captured image contains only text. This paper presents a camera-based text reading framework to help visually impaired people read texts in natural scenes, product labels, etc. Here, the task is divided into two phases, viz. text recognition and text recognition. Text recognition includes a text-localization step. First, let's resize the image. Geometric and linewidth filtering removes non-textual areas of the image. A segmented text area in a mixed scene is binary transformed and detected by optical character recognition. Recognized texts are delivered in speech to the visually impaired. The experimental result shows that the proposed method provides better performance in text recognition.

2.9 A smart reader for blind people

This article presents an intelligent robot to help the visually impaired. Currently, 81 percent of people living in developing countries are visually impaired. Today, human communication is primarily focused on text and speech. A person needs sight to read a text. A study of several articles and systems provides hardware consisting of a camera interface with a Raspberry Pi for text processing. The camera records a text image of handwritten or typed text. The Raspberry pi uses the optical character recognition (OCR) software installed on it to convert the image to text and, consequently, the text to speech. The assistant is suitable for both visually impaired and normal people to increase the level of comfort

3. Conclusion

As the technology keeps on progressing at a very fast pace, making sure that this technology is affordable and reachable to all types of people is important. So as the new technology keeps on developing for visually impaired and making sure the gadgets that are being used are up to date. Text recognition and Face identification is developed to deal with people with visual disability, with the help of this system the person can hear text that is being identified in the document and can also be able to hear the name of the person that is recognized in the webcam. Over going through many research papers, we have found many studies and model made using OpenCV and CNN neural network to be more optimum in its working and was more accurate. Going forward we are using these two as the main algorithm and libraries to build the foundation for the project.

References

[1] Pradeepa M, H P Mohan Kumar, "Real time implementation of face recognition system," July 2020.

[2] Siva ganga, Hema, "A review on text recognition for visually blind people," Volume-7, 2nd Feb 2020.

[3] John Clark, Randy Eugene, Dylan Bryan, Bruce Albert, "A study of text detection and recognition," Volume 3, September 2020.

[4] Pradeepa M, H P Mohan Kumar, "Real time implementation of face recognition system," Volume 8, September 2020.

[5] Gauri Vaidya, Ketki Vaidya, Kishore Bhosale "Text recognition for visually impaired," March 2018

[6] Chaitanya R. Kulkarni, Ashwini B. Barbadekar, "Text detection and recognition: A review" Volume 4, June 6th 2020.

[7] Dev Gupta, Shourya Gupta, Aditi Khurana, "Review paper on facial recognition for visually impaired people," Volume 3, Issue 4th, April 2021.

[8] Liming Wang, Jianboa Shi, Gang Song and I-fan Sheen, "Object recognition" Conference paper 2007.

[9] L Latha, V geethani, M Divyadharshini P, Thanga, "A smart reader for blind people", January 2007