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# Text and Hand Gesture Detection for Incapacitation People

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**ABSTRACT:** Text recognition is important for visually impaired people. Text-to-speech (TTS) generates speech from text. This paper surveys text detection and conversion to speech. Many methods have been used for text detection. The paper reviews different techniques for text recognition. The paper proposes a laptop camera-based system to help blind people read text labels and packaging. The system has three components: scene capture, data processing, and speech output. The project also includes template matching for recognizing objects like currency notes. The application is based on a laptop camera system for portability.

**KEYWORDS:** Blind, Object, Detection, CNN (Convolutional Neural Network), OCR (Optical character Recognition), Deep Learning.

## I. INTRODUCTION

Text acknowledgment is the capacity of a machine to get and decipher manually written input from numerous sources like paper records, photos, contact screen gadgets and so forth. Acknowledgment of text on item and machine characters is an arising area of exploration and tracks down broad applications in banks, workplaces and ventures. Optical Person Acknowledgment (OCR) is a cycle by which text characters can be contribution to a PC by giving the PC a picture. The computer makes use of an OCR Engine, a computer program whose sole purpose is to determine which letter an image that is recognizable to a human represents is. Our system's primary goal is to extract and recognize text from an object, image, or hand gesture, as specified by the system. To give a simple UI to enter the article picture. The image should be unloaded by the user. The system ought to be able to suppress the background by pre-processing the given input. The image's text should be found by the system. Framework ought to recover message present in the picture and give sound as a result to the client.

## II. RELATED WORK

There are a number of tools for utilizing computer vision technologies to aid the blind. In about ten seconds, the mobile app Tap See uses crowd sourcing and computer vision to describe a picture taken by blind users. Text Detective is a mobile app from The Blindsight that uses optical character recognition (OCR) to read text from pictures taken with the camera. Facebook is creating picture subtitling innovation to assist blind clients participating in discussions with different clients about pictures.

A DuLight project demo video was recently made public by Baidu. At this time, there are no additional information regarding the product. On the other hand, the concept of describing scenes and recognizing people, money bills, merchandise, and a crosswalk signal is presented in the product video. However, these products did not use spatial sound techniques to further enhance the user experience and did not focus on enabling blind people to generalize their visual sense. A few works exist in the overall extent of tangible replacement.

Daniel Kish, who is completely blind, developed accurate echolocation skills by independently using "mouth clicks" to navigate while biking and hiking. Neil Harbisson, a colorblind artist, created a device that converts color information into sound frequencies. Voice technology makes a bold attempt to translate visual perception into sound.

Each camera snapshot is scanned by the voice system from left to right, and height and brightness are linked to loudness. However, all of these sensory substitution attempts have been associated with extremely challenging learning processes. On the other hand, our use of visual recognition algorithms results in more straightforward methods for comprehending objects in a visual scene.

Researchers have also looked into how to use 3D sound technology to help blind people and provide useful information. They introduced a system that uses spatial audio to help find points of interest in large, unfamiliar indoor environments (like shopping malls) and tried to incorporate 3D sound into GPS-based outdoor navigation products. However, none of those works make use of visual recognition. For blind and visually impaired individuals, the application of object detection techniques may open up new avenues for assisting with indoor navigation.

### III. PROPOSED METHODOLOGY

In this work, a clever text location and acknowledgment calculation is proposed. The system explains how to read printed letters on objects to help people who are blind. This suggested approach provides a solution to the reading difficulty faced by blind individuals. This framework will recognize the item from the caught picture and identify the texts from the picture. For the purpose of localizing text in natural images, the proposed method is demonstrated.

The OCR library used as captured images is used to evaluate the results. Users who are blind are being instructed to read hand-held objects by this system. Utilizing this calculation we are accurately recognizing the text in legitimate region. The OCR tool is used to recognize these texts after they have been localized. Actually, the reading of text from camera-based images is the foundation of this system. The productivity of the framework will be worked on by equal handling of text location and acknowledgment. Blind individuals receive text as a speech output from the output.

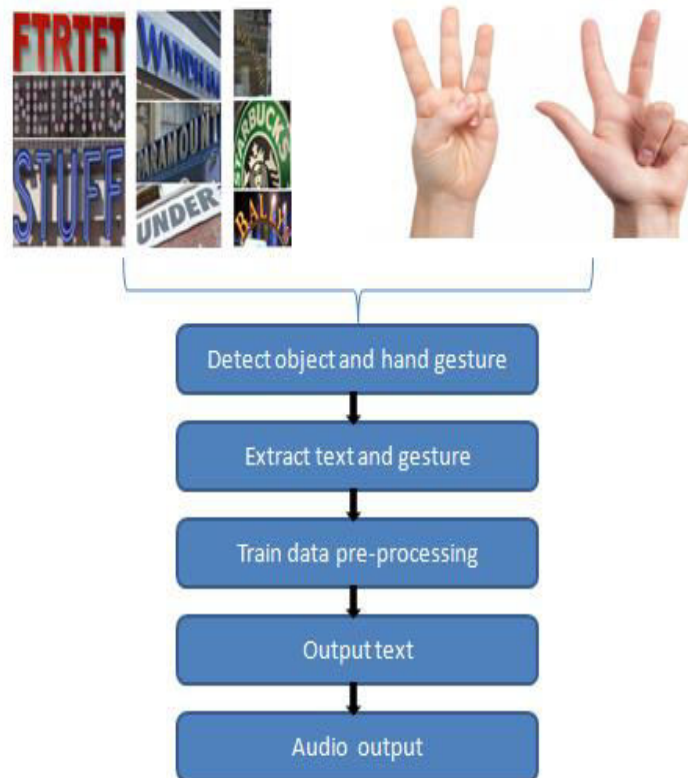


Fig 1. Proposed System Architecture

#### Optical character Recognition:

Optical character Recognition (OCR) is the process that converts an image of text into a machine-readable text format. For example, if you scan a form or a receipt, your computer saves the scan as an image file. You cannot use a text editor to edit, search, or count the words in the image file. However, you can use OCR to convert the image into a text document with its contents stored as text data.

#### IV. WORKING MODULE

The framework distinguishes the written by hand English word and produce its relating yield in English word and the result English word is changed over into sound, by utilizing various strategies. CNN (Convolutional Neural Network), OCR (Optical Character Recognition), and Deep Learning are the methods in question. In this work, a clever text discovery and acknowledgment calculation is proposed. The system explains how to read printed letters on objects to help people who are blind.

This suggested approach provides a solution to the reading difficulty faced by blind individuals. This system will identify the text in the image and the object in the captured image. For the purpose of localizing text in natural images, the proposed method is demonstrated. MSER is used to extract the image's textual information. This will removes the text designs from various foundations. The reliable text detection algorithm is this one. On localized text patterns, OCR is used to recognize text.

#### V. WORKING SCREEN SHOT

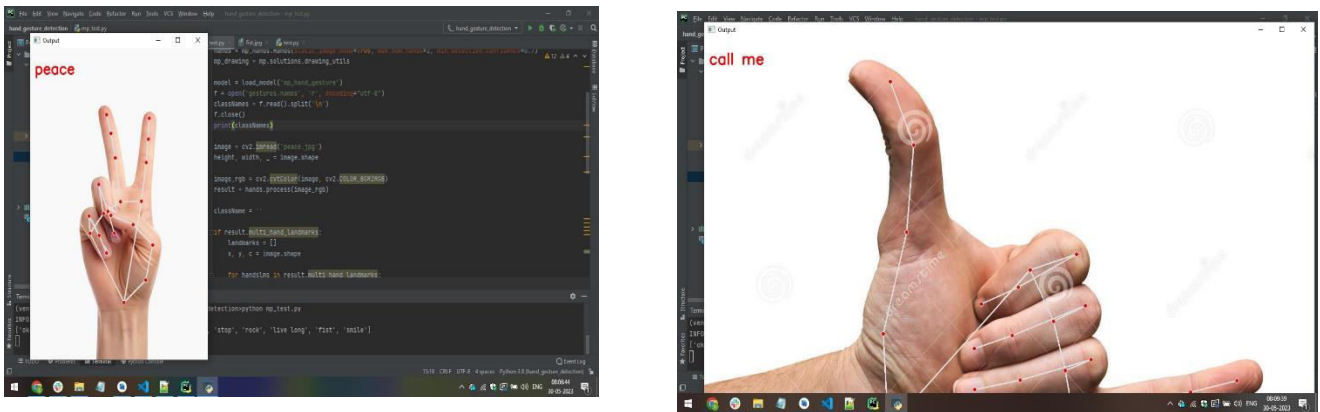


Fig 2: Hand gesture with text using mediapipe

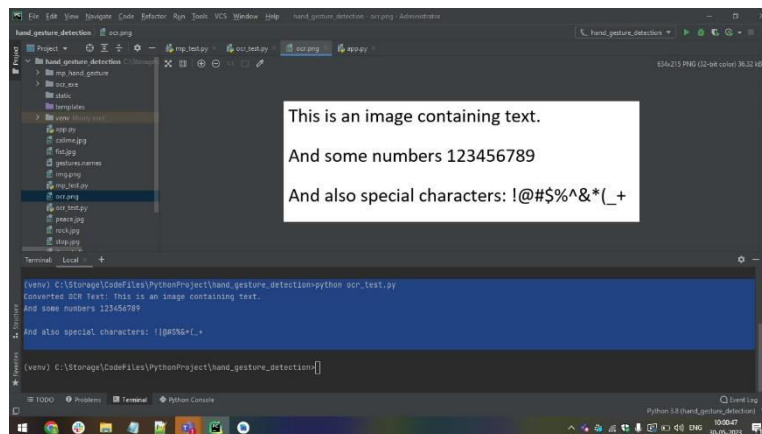


Fig 3: Text Detection using OCR

#### VI. CONCLUSION

Deep learning has begun to be used in a variety of applications, including OCR and target detection, as well as facial recognition, in recent years. In order to locate texts, researchers frequently employ various target detection networks, such as Faster and RCNN, in the OCR domain. With stable noise immunity and robustness, deep learning-based text recognition is superior to conventional text recognition. It can oppose impacts like changes in foundations. When it comes to text detection, the end-to-end network of deep learning is more accurate than traditional image processing,

cutting, and character classification made possible by machine learning. These project help mute and blind person to survey in crowded area without help of third person. System mainly work on OCR and mediapipe for gives high accuracy.

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