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# Facial Recognition Smart Glasses for Visually Challenged Person

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**ABSTRACT:**Blind people face many challenges in their daily lives. Their health and well-being are severely limited by the loss of their ability to see things around them, often with the use of blind navigation systems. The main goal here is to have a small, realistic, easy-to-use, low power, portable and powerful navigation solution. This paper (Facial Recognition Smart Glasses For Visually Challenged Person) is for blind people. It has a camera and controller that detects the person in front of the camera and tells the person their name through the speaker.

**KEYWORDS:**AI thinker ESP32 CAM Board WIFI + Bluetooth with OV2640 Camera, FTDI Module, APR33A3, Speaker.

## I. INTRODUCTION

The number of visually impaired people has increased in the last few decades, according to a WHO report. Among them about ninety percent of them are poor and do not have enough money, as we know that even if new resources or technologies are available it is more expensive or affordable but they only do limited jobs. So the ultimate goal of our work is to design a low-cost, efficient device that helps blind people to live as normal people on earth. The paper represents the design of clever eyeglasses for the visually impaired. Here the camera is mounted on the glasses of a blind person. A data set of people collected in daily forums and established to use the required identification. The ESP32 wrover module camera is used to locate a person. Our machine analyzes the features of a person's face using an ESP32 camera, measuring the overall shape of the face. These values are stored on a website that is stored on a website and is used as a comparison when a person stands in front of a person.

The entire body has a number of different landmarks, different peaks and valleys that include facial features such as distance between eyes, nose width, cheekbone, jaw line length and many other features. When a person is facing the camera the system will detect the person's face and do the same using the website. If a person's face matches it will mean the name of the person who got the speaker and if the person is anonymous it will mean someone who is unknown through the speaker.

## II. RELATED WORK

A literature survey offers us a notion about how the implementation can be completed based totally on ways to carry out work. The literature survey suggests the number of evaluations and lookup made in the area of our hobby and the outcomes already published, thinking about several parameters of the undertaking and the extent of the project. It is the most necessary section of the document as it offers us a course in the region of our research.

1. **Voscal view of the visually impaired [international issue of Issn, 2319-1805 Engineering and science 1-7-2013 Shrilekha Banger, Preetam Narkhede Rajashree Parajape.**

This book study is a visual aid program to help those who cannot see anything to move independently. Its practical vision is based on Research Article Volume 10 Issue No.9 JESC, September 2020 on the transformation of 'image into



sound'. The optic nerve captures the image in front of the blind person. This image is then provided to the Matrix laboratory for processing. The process of capturing the captured image correction and consolidating the visual image data. This processed image is compared to a database of data stored in a microcontroller. The modified data is then displayed as a standard acoustic signal system and transmitted to the blind user using a set of earphones.

**2. Acquisition Includes Recognition and Separation [Fudan University, Shanghai, PRC, University of Pennsylvania, 3330WalnutStreet, Philadelphia, PA 19104 Liming Wang<sup>1</sup>, Jianbo Shi<sup>2</sup>, Gang Song<sup>2</sup>, and I-fan Shen.]**

This book survey represents a way to find something that joins the attention from the bottom and the division of the image to the bottom. There are two main steps in this process: the hypothesis production step and the verification step. In the process of producing a low-level hypothesis, we are developing an improved feature of Shape Content, which is more robust in object transformation and background dynamics. The advanced Shape Theme is used to produce a set of imaginative ideas for object areas and image masks, with a high memory level and a low level of accuracy. In the verification step, we first compile a set of possible segments that are consistent with the assumption of the object from the bottom, and then propose the False Positive Pruning (FPP) process to extract false points. We take advantage of the fact that false regions often do not correspond to any possible image classification. Experiments show that this simple framework is capable of achieving both high memory and high accuracy with a few good training examples and that this approach can be widely used in multidisciplinary classes.

**3. Microsoft COCO Common Objects in Context [Tsung-Yi Lin, Michael Maire, Serge Belongie, Lubomir Bourdev, Ross Girshick, James Hays, Pietro Perona, Deva Ramanan, C. Lawrence Zitnick, Piotr Dollár (Submitted 1 May 2014 ( v1)), last updated on 21 Feb 2015 (this version, v3))]**

converter, a tool that makes blind people see text content. This is eliminated by the use of the Raspberry pi version, where portability is a systematic goal that is actually done because they represent a set of data for the purpose of improving the state of the art in object perception by placing the object identification in the context of the broader acceptance of the clip. This is achieved by collecting images of complex everyday clips that incorporate familiar elements into their original form. Objects appear using segments of each object to aid in precise localization.

**III. PROPOSED METHODOLOGY**

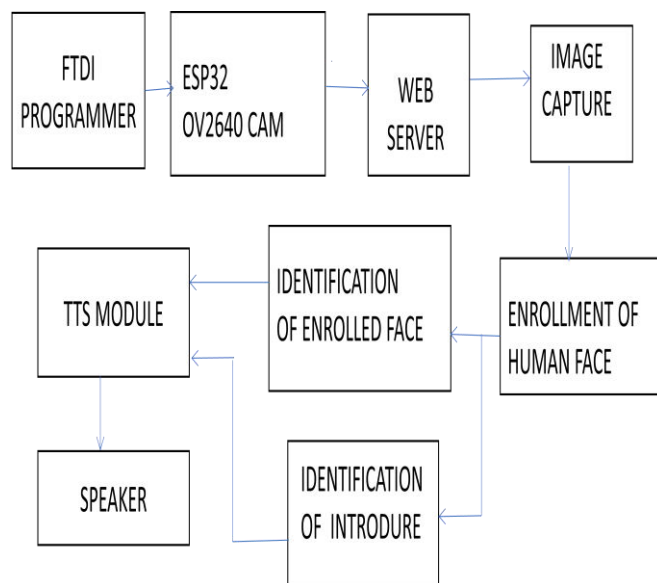


Figure 1.1: Block diagram



To understand a program we have to dump in esp32-cam, we use FTDI programmer and it will convert USB to TTL serial . When a person comes in front of esp32cam it captures the image, if the face is enrolled before than it will say a persons name through speaker. If the person is unknown it will say unknown person by converting text to speech.

ESP32-CAM:

The ESP32-CAM comes with 3 lower pins. low power camera module based on ESP32.Comes with OV2640 camera and provides internal TF card slot. ESP32-CAM can be widely used in intelligent IoT applications such as wireless video monitoring, Wi-Fi photo uploads, QR detection.

FTDI (Future Technology Device International):

It is used to connect a TTL series communication device to a PC via a small USB port with power outlet options set by the jumper on the board. It has 6 anchors DTR, RX, TX, VCC, CTS, GND.

ARP33-A3:

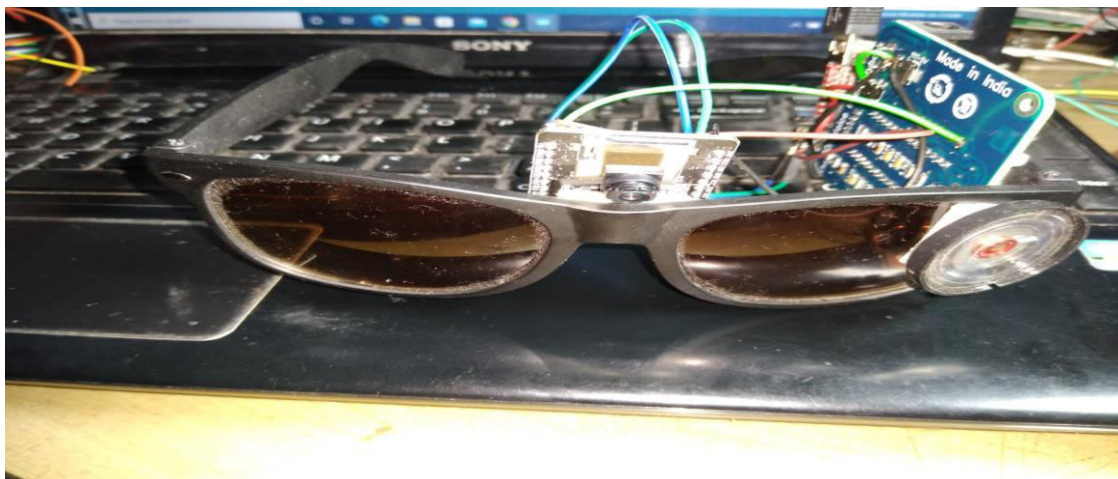
The voltage varies from 3 to 6.5 volts. It is a stable flash memory technology without saving battery required, has an external reset point, high quality line receiver, voice recording length of 340 ~ 680 sec.

SPEAKER:

Speakers are transducers that convert electrical waves into sound waves, sound production through a speaker is defined by frequency and length. Noise determined by changes in air pressure caused by speaker sound waves.

#### IV. SIMULATION RESULTS

When a perspn is detected by the camera there is a name by a known person in the text format that will be converted into speech and the output will be heard in audio format through the speaker.



#### V. CONCLUSION AND FUTURE WORK

We designed and implemented a smart glass for blind people using special mini camera. This project presents a new concept of smart glasses designed for visually impaired people using low cost Ai Thinker ESP32 CAMP board wi-fi + Bluetooth with ov2640 camera. For the demonstration purpose, the glasses are designed to perform text recognition.



The system capability however can be easily extended to multiple tasks by adding more models to the core program. Each model represents a specific task or mode. The user can have the desired task run independently from the other tasks. The system design, working mechanism and principles were discussed along with some experiment results. This new concept is expected to improve the visually impaired students' lives despite their economic situations. Immediate future work includes assessing the user-friendliness and optimizing the power management of the computing unit.

The future scope of this project is to enhance additional powerful sensors may be integrated with in the project to produce the detection of obstacles during wider vary. Project can be increased by victimization alternative techniques like RFID for indoor navigation camera to create it easier for the blind to acknowledge objects visage him/her. The project can be developed rotationally a mobile application that determine blind his location and guide him to right method with facilitate of headphones .We expect further improvements in the future as we develop new feature types including color, distance and other features. We also recommend using this component Movidius Neural Compute Stick (NCS) is a deep learning USB drive. The NCS is powered by the low power high-performance Movidius Visual Processing Unit (VPU). Run multiple devices on the same platform to scale performance.

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