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"Visual Assistant for Blind People"

Assit. Prof. P. R. Kene
DEPARTMENT OF COMPUTER ENGINEERING
JSPM's Jayawantrao Sawant College of Engineering
Hadapsar, Pune-28
Savitribai Phule Pune University, Pune
Onkar Jaywant Zende
DEPARTMENT OF COMPUTER ENGINEERING
JSPM's Jayawantrao Sawant College of Engineering
Hadapsar, Pune-28.
Savitribai Phule Pune University, Pune
Govinda Pradeep Upadhyay
DEPARTMENT OF COMPUTER ENGINEERING
JSPM's Jayawantrao Sawant College of Engineering
Hadapsar, Pune-28.
Savitribai Phule Pune University, Pune
Rutuja Vijay Shinde
DEPARTMENT OF COMPUTER ENGINEERING
JSPM's Jayawantrao Sawant College of Engineering
Hadapsar, Pune-28.
Savitribai Phule Pune University, Pune

Abstract—Blind people deal with the issue on a regular basis. They are incapable of even walking unaided. They frequently ask for assistance from others. There are many devices available to help persons who are visually impaired. Due to its accessibility and cost, computer vision-based solutions are emerging as one of the most promising possibilities among the different technologies being used to assist the blind. This essay suggests a system for those who are blind. The suggested system attempts to produce a wearable visual assistance for persons who are blind or visually impaired that the user may operate via vocal commands. Its features include the ability to identify signs and things. This will make it easier for the visually impaired person to manage daily tasks and get around.On the Open CV platform, artificial vision is implemented on a Raspberry Pi using the Python programming language.

I. INTRODUCTION

When an image is shown to us, our brain immediately recognises the objects it contains. However, for a machine to recognise these items, a lot of work and training data are required. However, given recent technology and deep learning advancements, this computer vision has gotten much simpler and more user-friendly. We are continuously looking for ways to create a "detection" or "recognition" system that is as potent as a person. Recently, WSOL, or weakly supervised object localization, has received a lot of interest.

It seeks to identify frequent objects in a collection of photos by utilising annotations to highlight their presence or absence. The goal of this research is to concurrently locate and find common things in real-world photos, which produces the same kind of output as WSOL but necessitates annotation of objects' presence or absence. Additionally, we address this problem in more difficult scenarios where: (1) Multiple common object classes are present in the provided set of photographs, indicating that this is an entirely unsupervised problem; (2) Some of the images contain multiple objects or even no objects.

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In order to achieve high accuracy and real-time performance, the project seeks to utilise cutting-edge object identification techniques.The reliance on other computer vision algorithms in many object recognition systems, which results in sluggish performance when using a deep learning approach, is a significant challenge.As well as inadequate performance. In this project, we take an end-to-end method to solving the object detection problem that is entirely based on deep learning.

In this project, we will define object detection and examine a few alternative methods for dealing with issues in this field. After that, we will go in-depth with creating our own Python object identification system. Approximately 2 to 3 percent of the world's population are blind or have limited eyesight today.

People who lack visual perception and are unable to see the thing are said to be visually impaired or blind. We are all aware that blind people speak a unique script known as Braille, which is a little challenging to learn.

However, they are able to hear, and this capacity allows them to pick up on environmental sounds.

This technique is quite challenging to use and takes considerable practise. To solve the issue of blind or visually impaired people having trouble reading the documents and text. Therefore, we must create a gadget that can read text or a document and emit a sound signal. Blind persons can interpret the text in the source of sound and can readily hear the sound. The vast majority of those who have vision loss will benefit from this system.

There are three modules in our system for detecting objects.The first produces proposals for regions independent of their category. These proposals specify the candidate detections that are currently available to our detector. The second module is a sizable convolutional neural network that takes each region's data and extracts a fixed-length feature vector.

OBJECTIVE:

- The only AI-related technology in use at the time was a device that used an Arduino Uno to capture objects.
- As of right now, the work to find, identify, and track the object was successful. It also serves to prevent users from handling hot objects. Blind's Vision Fist receives a live video feed at a frame rate of 60–70 fps as input.
- The system's output comes in the form of verbal assistance and fist vibrations. Thus, in the future, work would be done on character recognition, navigation to multiple objects, and moving object catching.

MOTIVATION:

•We are inspired by the current system. Using a scale-invariant feature transform, we must match user objects with database images.

• In that system, we pre-process the video first, then choose feature extraction, compare the item with the database, and get the outcome.

• Finding or identifying instances of objects (such faces, dogs, or buildings) in digital photos or movies is the process at hand.

• In order to recognise instances of an object or photos that belong to an object category, object recognition methods often use extracted characteristics and learning algorithms.

• While object detection seeks to locate a specific object of interest in digital photos or videos, object class recognition works with categorising objects into a certain class or category.

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PROBLEM STATEMENT:

- Blind persons have several difficulties in daily life, from reading a book to crossing the street.
- There are numerous instruments at their disposal to deal with the difficulties they experience, but they are insufficient.
- Vision is the most important thing a human may possess, and it is vitally important to a person's existence whether they can see or not.

SCOP:

- Every individual who is blind or visually impaired has a varied range of vision; for instance, one person cannot read but does not need a white cane to go around, while another can read but cannot see their surroundings.
- Oftentimes, night blindness and sensitivity to glare are symptoms of visual impairment.

II. RELATED WORK

Sr.No	Author	Title	Description
1	Fares Jalled	Image Processing for Object Detection	The main goal of this post is to create an OpenCV-Python code for object and face detection using the Haar Cascade technique. Currently, penetrated ground targets are found and attacked using UAVs.
2	Xiang Wang, Huimin Ma	Salient Object Detection Using Edge Preserving and Multi-Scale Contextual Neural Network.	In this paper, we suggest a brand-new multi-scale contextual edge-preserving neural network for salient object recognition. The suggested framework aims to solve two shortcomings in the current CNN-based approaches.
3	Xiaozi Chen, Kaustav Kundu	Stereo Imagery for Accurate Object Class Detection in 3D Object	In this research, we offer a novel 3D object detection method that makes use of stereographic images and contextual data unique to the autonomous driving field. We suggest a method for 3D object proposal that goes beyond 2D bounding

		Proposals.	boxes and can produce excellent 3D bounding box suggestions.
4	ChristianSzegedy, Dumitru Erhan	Object detection on a large scale utilising deep neural networks	In recent years, deep convolutional neural networks have excelled at a number of benchmarks for image identification, such as the ImageNet Large-Scale Visual Recognition Challenge (ILSVRC-2012).
5	Ross Girshick1 Jeff Donahuel	For precise object detection and semantic segmentation, rich feature hierarchies are required.	The mean average precision (mAP) of the detection algorithm we propose in this research is improved by more than 30 compared to the previous best result on VOC 2012, yielding a mAP of 53.3. Our strategy incorporates two crucial insights. We refer to our approach as R-CNN: Regions with CNN features since we mix region proposals with CNNs.
6	Dr. I S Akila	Using a Raspberry Pi, a Text Reader for People Who Are Visually Impaired	It's not always clear how difficult it is for visually impaired persons to read printed materials in their daily lives. This study is based on a prototype that enables the user to hear the English and Tamil text pictures' contents.

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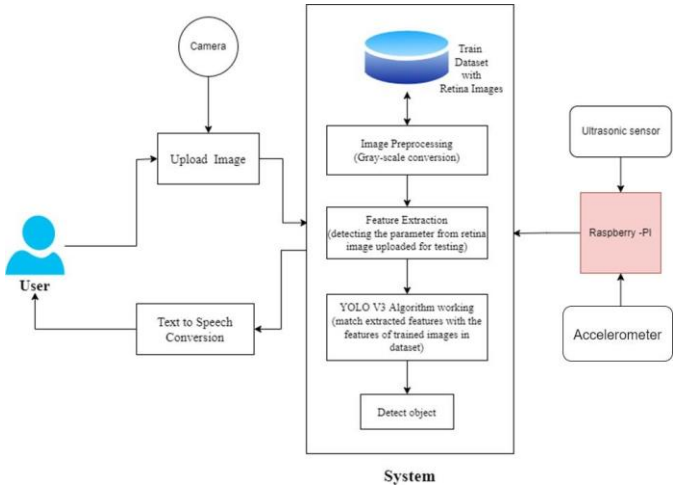
III. SYSTEM ARCHITECTURE



ARCHITECTURAL DESIGN

Admin

• The Admin must enter a valid user name and password to access this module. Once logged in successfully, he can perform certain tasks, including Authorize, View All Users View Every Website for E-Commerce and Authorize View All Reviews and Products, View All Product Review Rank Results, View All Keyword Search Details, View All Product Search Ratio, and View All Early Reviews for All Products.

Check out and Authorize Users

• The list of users who have registered can be seen by the administrator in this module. The admin can examine the user's information in this, including user name, email address, and address, and admin can also authorise users.

Chart Results View

• View All Items View all keyword search results, view all product review rank results, and search ratio.

Ecommerce User:

• There are n different users in this module. Before doing any operations, the user should register. Once a user registers, the database will record their information.

After successfully registering, he must log in using an authorised user name and password. After successful login, the user will perform certain actions, such as adding products, View All Early Product Reviews, View All Purchased Transactions, and All Products with Reviews.

End User

• There are n different users present in this module. Before doing any operations, the user should register. After a user registers, their information is added to the database.

After successfully registering, he must log in using an authorised user name and password. When a user successfully logs in, they can perform a number of actions, including manage their account, search for and buy products using keywords, view search transactions, and view

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IV. IMPLEMENTATION:

During the project's implementation phase, we successfully implemented the various modules needed to achieve the desired results at the various module levels. The system is initially built as small programmes known as units with input from the system design, and is then combined in the following phase. Unit testing is the process of developing and evaluating each unit for functionality.

V. DEPLOYMENT OF SYSTEM:

• Once the product has through functional and non-functional testing, it is either published to the market or deployed in the customer's environment.
• Various problems can arise in a client environment. Patches are published to address certain problems. Additionally, improved versions of the product are issued.
•All these phases are cascaded to each other in which progress is seen as flowing smoothly downwards like a waterfall through the phases. Maintenance is done to supply these changes in the client environment. The "Waterfall Model" gets its name because the following phase doesn't begin until the prior phase's established set of goals have been met and it has been approved. Phases do not cross over in this model.

APPLICATION:

• Blind People's Use of Assistive Technology Assistive technology is a broad phrase for gear and software that makes technology usable by people with disabilities (AT).
• The main assistive technologies for blind persons are screen readers, braille displays, and speech recognition software.

ADVANTAGES:

•The issue of image/instance retrieval can also be easily solved using our suggested framework.
• We carry out extensive experiments in a variety of settings and compare the results with numerous representative studies to assess the proposed method.

VI. RESULTS

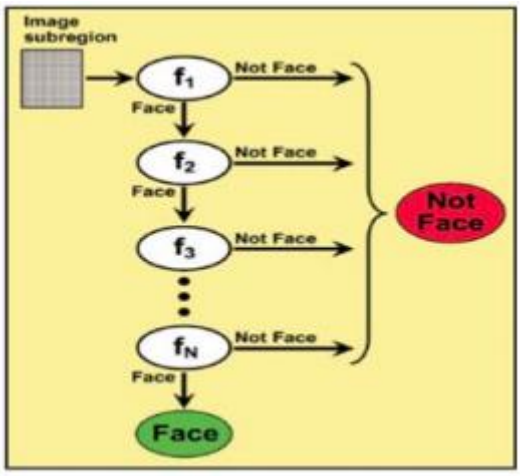

Fig. Harr Classifier

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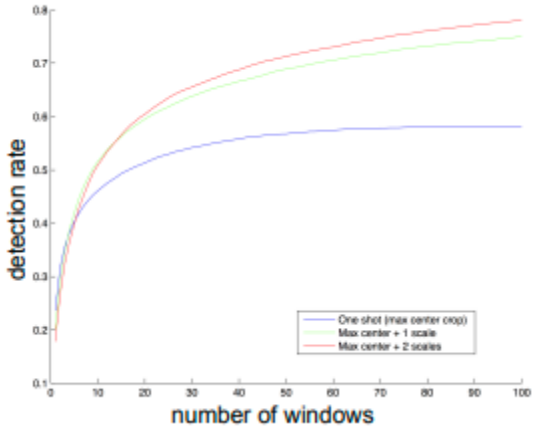

Fig. Graph

Object detection: During this stage, it is quite simple to find actual objects in the real environment. like people in still photos or movies. The examples of the how-to objects in the figure below are identified with ease.

The project's results are shown in the above figure, which also illustrates how objects were discovered. You will see a window with a live feed from your camera when the script has been running for 30 seconds. There will be a list of common items inside the view, and a rectangle will be painted around each one. The single object laptop in the figure displays an accuracy of 87%.

Voice Assistant: At that time, the technology is solely used by visually handicapped people, thus it is simple and trustworthy. The System says out all that the user wants to hear, and the user uses all bespoke layouts but system data instead of their own, saving a lot of space. The majority of vital tasks can be done without an internet connection. These modules make it simple for blind people to use them.

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VII. SUMMARY AND CONCLUSION:

We suggest a paradigm for finding and locating common objects in wild ages. Like the majority of earlier techniques, which operate under the presumption that each positive image contains just one object, We then describe a constrained sub-graph mining approach to optimise the two models, which is inspired by min-cut/max-flow algorithms. By correctly applying neural networks, we can both classify and detect the item.

Image enhancement, motion detection, object tracking, and behaviour understanding studies have all been explored in order to analyse images and extract high level information.

In this essay, we examined and discussed some moving object recognition techniques that are applied to video surveillance.

We have divided detection methods into a number of categories, and here we also examine problems with the moving object detection method.An issue with temporal differencing is that it frequently misses important foreground object pixels, particularly when the object has a uniform texture or travels slowly.

The temporal differencing approach is unable to recognise a difference between two successive frames when a foreground object stops moving, and it loses track of the object. This article supports future study in the fields of computer vision and moving object recognition by providing insightful information on this crucial research topic. Various estimate techniques are utilised in the kernel tracking strategy to identify the region that corresponds to the target object.

Today, mean-shift tracking and particle filters are the most recommended and well-liked kernel tracking approaches. Depending on how the contours evolve, contour tracking can be classified as either a state space approach or an energy function minimization method.

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