Object Detection and Character Recognization for Blind Peoples

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Abstract— There are millions of blind people in the world who are visually impaired. Disability to read has a large impact on the life of visually impaired people. The Proposed system is cost-efficient and helps the visually impaired person to hear the text. The main idea of this project is optical Character recognition which is used to convert text character into the audio signal.

Keywords: Blind, Feature extraction, OCR, CNN

I. INTRODUCTION

When our brain is confronted with an image, it almost immediately recognizes the objects contained inside. A machine, on the other hand, requires a significant amount of time and training data to recognize these items. Recent hardware and deep learning advances, on the other hand, have made the field of computer vision more accessible and intuitive. We're still looking for ways to create a 'detection' or 'recognition' system that can match the accuracy of a person. Weakly Controlled Object Localization (WSOL) has recently attracted a lot of attention. Its aim is to recognize common objects in photographs by indicating their presence or absence with annotations. We also consider a more complicated scenario in which: (1) the given set of images contains multiplecommon object classes, indicating that this is an unsupervised problem; and (2) some of the images contain multiple objects or none at all. The aim of the project is to bring together cutting-edge object detection techniques with real-time performance. Object detection systems that rely on additional computer vision techniques to supplement the deep learning-based approach face a major challenge, resulting in sluggish and inefficient performance. In this project, we use deep learning to solve the problem of object detection from beginning to end.

II. RELATED LITERATURE

Fares Jalled, ´ Moscow Institute of Physics & Technology," Object Detection Using Image Processing"[1], The primary objective of this article is to write OpenCV-Python code that uses the Haar Cascade algorithm to detect objects and faces. At the moment, unmanned aerial vehicles (UAVs) are used to track and kill ground targets that have been infiltrated. The primary disadvantage of this type of UAV is that the target is not always properly marked, resulting in a collision between the object and the UAV. This project's objective is to prevent such unintended UAV collisions and damage. The Voila-jones algorithm is used in UAV surveillance to detect and monitor humans. This algorithm makes use of both the cascade object detector and vision.

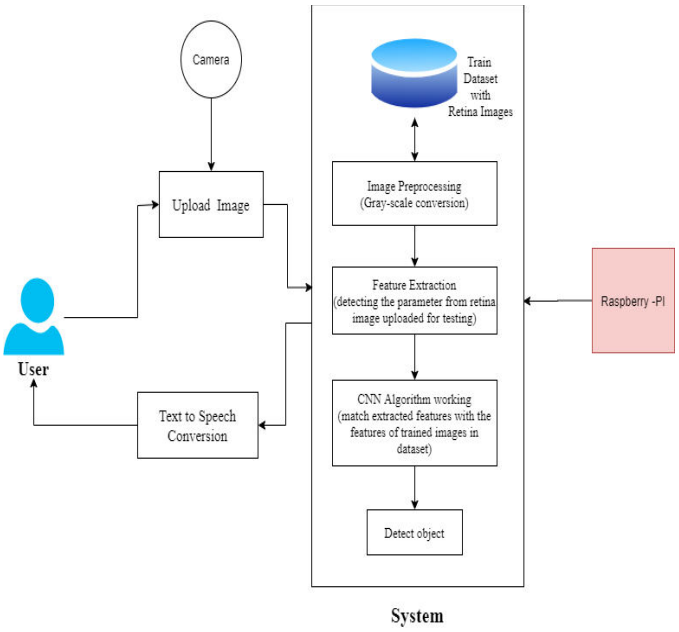
Xiang Wang, Huimin Ma , Member IEEE, Xiaozhi Chen, and Shaodi You." Edge Preserving and Multi-Scale Contextual Neural Network for Salient Object Detection."[2]. Throughout this article, we proposes a method multi-scale contextual neural network for detecting salient objects that preserves edges. The new paradigm addresses two shortcomings inherent in previous CNN-based methods. To begin, since each region is treated independently, area-based CNN approaches lack the necessary context information to accurately distinguish salient artifacts. Second, the existence of convolutional and pooling layers results in fuzzy boundaries in pixel-based CNN approaches. As a result of these results, we propose Region Net, an end-to-end edge-preserved neural network based on the Fast R-CNN system that can efficiently generate saliency maps with sharp object boundaries. For the first time, the proposed architecture achieves both simple detection boundary and multistate contextual robustness concurrently, resulting in optimal efficiency. The proposed approach outperforms the competition in experiments on six RGB and two RGB-D benchmark datasets.

B.Deepthi Jain., Shwetha. M.Thakur, K.V.Suresh, April 2018." Visual Assistance for Blind Using Image Processing."proposed a wearable model for the blind people which is capable of identifying the objects using image processing techniques and also the distance between the objects is identified using the ultrasonic sensor.Raspberry pi module is used for computation and implementing the algorithm where the modules such as the OpenCV and python language is used for the implementation.

Vikky Mohane Prof. Chetan Gode,YCCE,Nagpur,India,2016." Object Recognization For Blind people using Portable Camera." In recent years, some solutions have been devised to help blind people or visual impaired in recognizing objects in their environment But it is not that efficient to recognize surrounding objects our purpose is to provide a robust and easy system for blind people to recognize their surrounding objects. Our proposed system uses a single camera capture images of the view in front of the user.

ShoroogKhenkara, Hanan Alsulaimana , Shahad Ismaila , Alaa Fairaqa Salma KammounJarrayaa, and Hanêne Ben- Abdallah,October 2016." ENVISION:Assisted Navigation of Visually Impaired Smartphone Users" Range-based and Intensity-based approach, these basically use laser scanners to obtain range and intensity values for 2D or 3D mapping. Other approaches use image feature descriptors, e.g. pixels appearance, image grid and interest points.
However, there are assumptions and limitations of some previous approaches such as detecting a certain type of obstacles only or assuming that the ground is relatively flat or there are no overhanging obstacles and obstacles are relatively far from the user.

Modules:

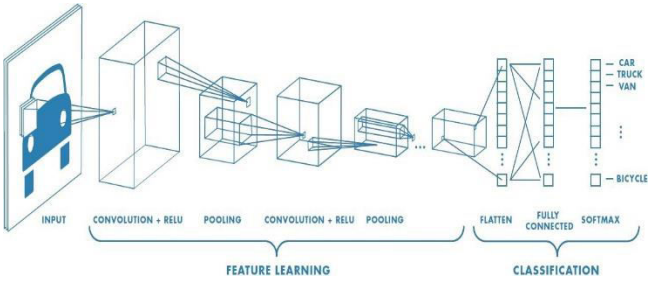


Pre-processing: - The goal is to In this module, the machine will process the input. The data-set will be trained by the prepossessing computer, which will remove the noisy parts of the input. after which you can resize the data-set

Segmentation: It entails segmenting a visual input to make image analysis easier. We can split the image up into segments in which we can do further processing if we want to remove or identify something from the rest of the image, such as detecting an object from a context. This is referred to as segmentation. Segments are made up of sets of pixels, or "super-pixels," that represent objects or parts of objects.

Feature Extraction: Points, edges, and artifacts are all examples of image structures that can be used as functions. Feature extraction is the method of reducing the number of features in a dataset by reusing previously used ones (and then discarding the original features). The original set of features should then be capable of summarizing the vast majority of the data contained in the new reduced set of features. Feature extraction starts with measured data and generates derived values (features) that are intended to be insightful and non-redundant, thus promoting learning and generalization processes and, in some cases, resulting in more precise human interpretations. The extraction of features and the reduction of measurements are inextricably related.

Classification: CNNs are used for image detection and recognition due to their high precision. In a classification convolutional neural network, each set of neurons analyses a specific region or "feature" of the image in a three-dimensional structure. A CNN's neurons are divided into groups that each concentrate on a different aspect of the picture. The algorithm examines smaller sections of the images. The end result is a probabilistic vector predicting the likelihood of each feature in the image belonging to a class or category.



III.CONCLUSION

We propose a method for identifying and locating common objects in photographs taken in the wild. As is the case with the majority of previous methods, this one is based on the premise that each positive image contains a single entity. The two models are then optimized using a constrained sub-graph mining algorithm inspired by min-cut/max-flow algorithms. We can recognize and detect the target by properly utilizing neural networks. To view images and obtain high-level information, image enhancement, motion detection, object tracking, and behavior comprehension analysis have all been studied. We examined and addressed different methods for detecting moving objects in video surveillance in this paper. We've classified detection techniques into many categories, and we'll discuss the issues that arise when using the moving object detection technique. The downside of temporal differencing is that it does not remove all relevant pixels from a foreground object, which is particularly true when the texture is uniform or the object moves slowly. When a foreground object ceases to move, the temporal differencing method fails to detect a switch between consecutive frames, and the object is lost. This article offers valuable knowledge about this important area of study and encourages new research in the fields of moving object detection and computer vision. The kernel tracking approach employs a variety of estimation methods to determine the area that corresponds to the target object. Today, the most general and commonly used kernel tracking techniques are mean-shift tracking and particle filtering. Contour monitoring may be categorized as a state space system or an energy feature minimization process, depending on how contours evolve.

REFERENCES

[1]. Samruddhi Deshpande,Revati Shriram,"*Real time text detection and recognization on hand held objects to assist blind Peoples*",2016International conference on automatic control and dynamic optimizationTechniques(ICACDOT),Publisher IEEE ,16 March 2017.

[2]. M.Murali,Shreya Sharma,Neel Nagansure,"*Reader and object detector for blind*",2020 international conference on communication and signal processing(ICCSP),Publisher IEEE, 01 September 2020.

[3]. N.Shobha Rani,S. Kavyashree,R. *Harshita"Object detection in natural scene image using thresholding Techniques*",2020 4thinternational conference on intelligent computing and control systems(ICICCS),Publisher IEEE, 19 June 2020.

[4]. Vikky Mohane,Chetan Gode,"*Object recognization for blind people using Portable Camera*",2016 World conference on futuristic Trends in Reasearch and innovation for Social welfare(Startup Conclave),Publisher IEEE, 06 October 2016.

[5]. Arpit Jain,Xujun Peng,Xiaodan Zhubang,Pradeep Natarjan,Huaigu *Cao"Text detection and Recognization in Natural scenes and Consumer Videos*",2014 IEEE international Conference on Acoustics and Signal Processing(ICASSP),Publisher IEEE,4 July 2014.

[6]. M. Muralikrishna,D.V.R.Kotti Reddy,"*An OCR-character segmentation using Routing based fast replacement paths in Reach Algorithm*", 2011 International Conference on Image Information Processing,Publisher IEEE, 22 December 2011.