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Object Detection in Real-time video

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ABSTRACT

Object detection methods aim to identify all target objects in the target image and determine the categories and position information in order to achieve machine vision understanding. Numerous approaches have been proposed to solve this problem, mainly inspired by methods of computer vision and deep learning. However, existing approaches always perform poorly for the detection of small, dense objects, and even fail to detect objects with random geometric transformations. In this study, we compare and analyse mainstream object detection algorithms and propose a multi-scaled deformable convolutional object detection network to deal with the challenges faced by current methods. Our analysis demonstrates a strong performance on par, or even better, than state of the art methods. Experiments prove that our suggested framework improves the accuracy of detecting small target objects with geometric deformation, showing significant improvements in the trade-off between accuracy and speed.

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I. INTRODUCTION

All Object Recognition has two parts- Category Recognition and its detection. Category Detection deals with distinguishing the object from the background And Category Recognition deals with classifying the object into one of the predefined categories. It is a identifying process of specific object in a digital image or video. Generally, Object recognition algorithms rely on matching, learning, or pattern recognition algorithms using appearance-based or feature-based techniques.

For example, it is used to find instances of real life objects like bicycles, fruits, animals and buildings in images or videos.
Tracking systems have served well in the field of video surveillance, militarily guidance, robot navigation, artificial intelligence and medical applications during the last two decades. It's vigour to the variability in the visual by dynamic, over the top environment.

Object tracking is a procedure of movement estimation in computer vision application we present a combined multiple object tracking technique for a video. A video is a frame by frame sequence of images. Optical flow is a flexible representation of visual motion that is particularly suitable for computers for analysing digital images. In this existing work the Horn and Schunck method is used to find the optical flow vectors which in turn pave a way for the detection and tracking of the single moving object in a video. Kalman filter removes the noise that effects a background subtracted image and predicts the position of an object accurately. A combination of Optical flow and Kalman filter method is designed in order to attain an accurate object tracking system. The accuracy of occluded object in dynamic background is promising compared to simple background subtraction. The experiments are conducted on different videos to prove the efficiency and the results are discussed.

Problem Statement:
To detect and recognize specific objects in a video and track their movements as the video runs

II. LITERATURE SURVEY

Object tracking using image processing", this paper mainly focuses on the basis to implement the object detection and tracking based on its color and shape. Visual monitoring of activities using cameras automatically without human intervention is a challenging problem. Moving object detection is very important in intelligent surveillance. In this paper, an improved algorithm based on frame difference is presented for moving object detection. The method of

motion detection and tracking is background subtraction. This paper mainly focuses on the basis to implement the object detection and tracking based on its color. In this paper, The author proposes a new object tracking model to systematically combine both region and shape features. Compared with existing approaches, our work has major contribution in tracking object from any video in noisy environment.

"Real Time Object Detection and Tracking System (locally and remotely) with Rotating", This paper presents an implementation of real time detection and tracking of an unknown object Detection of a moving object is necessary for any surveillance system. This paper describes object tracking application and its implementation using different designs with rotating camera. The author also proposes two different algorithms for rotation of the camera according to data given by the object detection algorithm. This paper also describes study and features of different object tracking algorithms in application. This implementation can be expanded for multiple object tracking as well. With static camera multiple objects can be detected and tracked as long as they are in the line of sight of the camera. But with a moving camera multiple objects can be detected and any one object can be tracked. Multiple cameras can be used to detect and track multiple objects. The cameras can be synchronized to detect and track different objects. These algorithm can be ported to android application and with high end mobile devices (faster CPUs), they can run flawlessly and one can use mobile to give signal to embedded board to control motor over network.

"Mobile Robot for Object Detection Using Image Processing", This paper describes a robotic application that tracks a moving object by utilizing a mobile robot with sensors and image processing. In the majority of surveillance and video tracking systems, the sensors are stationary. Thus author have implemented Robotic Application which will detect the objects and avoid the obstacles. The application have developed is a Desktop Application in that the user gives a command to capture image .This image is stored as destination image. After that user gives command to start the robot which will capture the image. This newly captured image will be compared with the destination image. Comparison will give a conclusion whether the captured image matches with the destination image or not. This system compares the images using region wise comparison. The system is implemented using J2EE, Java Swing and proteus technologies.

"Practical Applications of Robotic Hand using Image Processing", Robotic hand is used in image processing these paper Presents various application for robotic hand. The robot and robotic arm provide main function and useful for human worker in industry. In this paper author establish practical laboratory application. This application provides total information of project that is essential for robotic arm. The object detect and contour extraction methods are implemented this method are implemented using image processing technique. The robotic arm is moving in desired direction. In this scenario firstly MATLAB is used. Here the moving camera which is moved in both direction is used the is object is also moving. In this scenario system capture image and image acquisition is done.

III. SYSTEM ARCHITECTURE

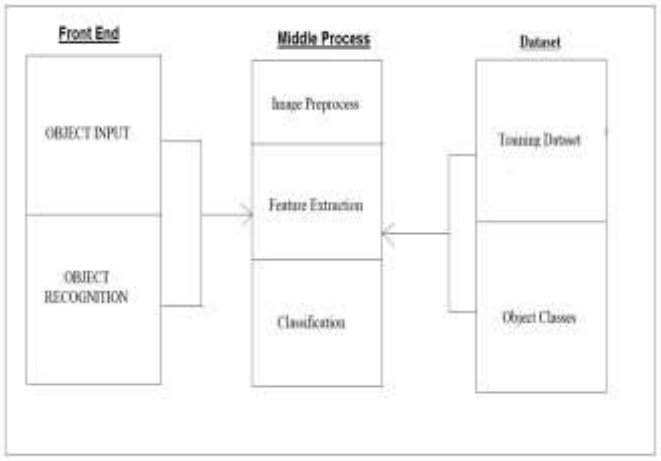

Fig 1. System Architecture

A. Description:

GUI Application:
Three tier Desktop applications consist of presentation logic, business logic and data logic. Presentation logic is where user interface (UI) is developed using which users initiate web requests. Business logic is where the validations and web service functionalities are written. Data logic is related with all the database queries generated as a result of web requests.

Capture Live Image:
Camera capture image for object reconisation.

Image Processing:
In this steps image send the conversion and pre-processing stage

Object detection and reconisation system:
In this module system will take input an image. Then it will perform certain operation on it like feature extraction, noise removal and recognise the object type.

IV. CONCLUSION

Object Detection and Recognition is a technology in the field of computer vision. It is considered to be one of the difficult and challenging tasks in computer vision. Many approaches have been proposed in the past, and a model with a new approach, which is not only fast but also reliable. Object detection model has been compared with various other models as well. Objet detection model looks at the whole image at test time so its predictions are informed by global context. At the prediction time, our model generates scores for the presence of the object in a particular category. It makes predictions with a Single network evaluation. Here object detection is a regression problem to spatially separated bounding boxes and associated class probabilities.

V. FUTURE WORK

The routing for avoidance can be studied in detail and efficient algorithms can be proposed. Moreover, the system

is still a theoretical proposition, which can be implemented in every environment with different application.

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