MINOR PROJECT SYNOPSIS ON

REAL TIME OBJECT DETECTION USING OPENCV

UNDER TAKEN BY

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Index

1. TITLE

Real time object detection using opencv

2. ABSTRACT

Object detection is a key ability required by most computer and robot vision systems. The latest research on this area has been making great progress in many directions. Object detection and tracking has a variety ofuses, This paper presents the various applications of object detectionsystem. In this we discuss current and future applications of object detection system in various fields.

3. INTRODUCTION

Object Detection is the process of finding real-world object instances like car, bike, TV, flowers, and humans in still images or Videos. It allows for the recognition, localization, and detection of multiple objects within an image which provides us with a much better understanding of an image as a whole. It is commonly used in applications such as image retrieval, security, surveillance, and advanced driver assistance systems (ADAS).

Object Detection can be done via multiple ways:-

1. Feature-Based Object Detection
2. Viola Jones Object Detection
3. SVM Classifications with HOG Features
4. Deep Learning Object Detection

Applications Of Object Detection:-

1. Facial Recognition:-

A deep learning facial recognition system called the “DeepFace” has been developed by a group of researchers in the Facebook, which identifies human faces in a digital image very effectively. Google uses its own facial recognition system in Google Photos, which automatically segregates all the photos based on the person in the image. There are various components involved in Facial Recognition like the eyes, nose, mouth and the eyebrows.

2. People Counting:-

Object detection can be also used for people counting, it is used for analyzing store performance or crowd statistics during festivals. These tend to be more difficult as people move out of the frame quickly.

It is a very important application, as during crowd gathering this feature can be used for multiple purposes.

3. Industrial Quality Check:-

Object detection is also used in industrial processes to identify products. Finding a specific object through visual inspection is a basic task that is involved in multiple industrial processes like sorting, inventory management, machining, quality management, packaging etc.

Inventory management can be very tricky as items are hard to track in real time. Automatic object counting and localization allows improving inventory accuracy.

4. Self Driving Cars:-

Self-driving cars are the Future, there’s no doubt in that. But the working behind it is very tricky as it combines a variety of techniques to perceive their surroundings, including radar, laser light, GPS, odometry, and computer vision.
Course Curriculum
AI & Deep Learning with TensorFlow

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Advanced control systems interpret sensory information to identify appropriate navigation paths, as well as obstacles and once the image sensor detects any sign of a living being in its path, it automatically stops. This happens at a very fast rate and is a big step towards Driverless Cars.

5. Security:-

Object Detection plays a very important role in Security. Be it face ID of Apple or the retina scan used in all the sci-fi movies.

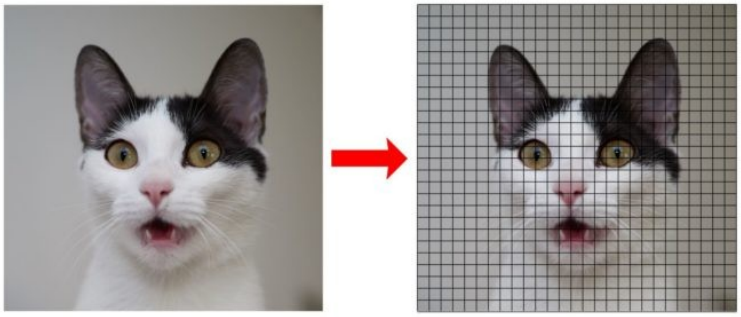
It is also used by the government to access the security feed and match it with their existing database to find any criminals or to detect the robbers’ vehicle.

The applications are limitless.

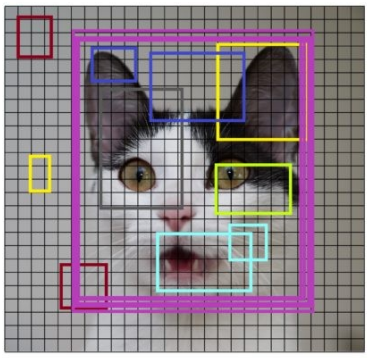
4. PROPOSED METHOD / ALGORITHM

Generally, the object detection task is carried out in three steps:-

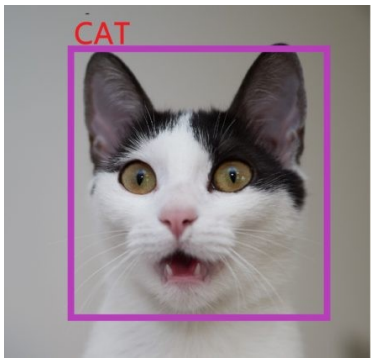
1. Generates the small segments in the input as shown in the image below. As you can see the large set of bounding boxes are spanning the full image



2. Feature extraction is carried out for each segmented rectangular area to predict whether the rectangle contains a valid object.



3. Overlapping boxes are combined into a single bounding rectangle (Non-Maximum Suppression)



5. PROGRAMMING ENVIRONMENT AND TOOLS USED

Programming Languages:-

Python:-

To code the development functionalities.

Libraries and Frameworks:-

OpenCv:-

It is the huge open-source library for computer vision, machine learning, and image processing and now it plays a major role in real-time operation which is very important in today's systems. By using it, one can process images and videos to identify objects, faces, or even the handwriting of a human.

Development Environment:-

Anaconda and Jupyter Notebook:-

To design and develop.

6. REFERENCES

URL https://www.mygreatlearning.com/blog/object-detection-using-tensorflow
URL https://en.wikipedia.org/wiki/Object_detection