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A Survey on Real Time Object Detection

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Abstract— ***We show that real time object detections performed using Yolo v4 on both images. This particular experiment informs approach. We will be using scaled yolo version 4 which is the latest version of yolo v4 and is fastest and accurate object detector.***

I. INTRODUCTION

In To achieve more accuracy in object detection we need object detectors which are expensive nowadays. The main purpose of object detection is to recognize images and videos fast and accurate.

There are many applications of object detections used in real life. For example object detection in retail, autonomous driving, animal detection in agriculture etc.

Object detection can be achieved using many other ways like CNN,RCN,YOLO etc.This paper includes how to achieve this using yolo Algorithm.

Bounding boxes are generated for a particular sets ment from easy of images and scores are assigned to it.

II. WORK

Tsung-Yi Lin majorly focused on loss on object detection. The accuracy is based on two stage:

It t about the large class imbalance that we get during the training of dense detectors.

Focus loss is used when there is an large changes between the back ground and foreground classes. Here we define focus loss using the formula, that is

FL(pt)=-(1-pt)Ylog(pt)

1) If an example is wrongly classified and the value of pt small, then the modulating value will be n early equal to one and the loss be uninfluenced.
2) The parameter gamma will adjust with the rate of easy examples are downweighted. When gamma=0,FL will be analogous to CE. The modulating factor decreases the endow

examples and it also streches the range in which we receives.

YOLOV4- large is practically designed for clou-D GPU,whose main role was to enable achieve high accuracy of object detection.

When we compare the other real time object detector ,we can observe that all scaled YOLOv4-CPS,YOLOv4-P5 are pareto optimal on all indicators.

R-CNN user deep networks to demonstrate region proposals.

In this case, convolutional networks is evaluated on cropped regions.

Deep learning dominates object detection completely.

These are one stage detectors and two stage detectors.

Example for one stage detectors are YOLO where is speed is considered and two stage detectors are faster R-CNN when accuracy is considered.

III. TWO STAGE DETECTORS

Objects are detected based on these two methods:

The first method is a data set that is formed of candidate proposals which must have objects.

The second method is where classification of candidate proposals take place where it is classified into foreground classes.

The R-CNN network are updated as the second method to convolutional network to imporve its more accuracy in object detection.

IV. ONE STAGE DETECTORS

The first object detector in the modern era was Over Feat which is a one stage detector that uses deep network.

There are many one stage methods which are SSD and YOLO.

YOLO is better compared to SSD which focuses mainly in the extreme speed and accuracy.

V. COMPARATIVE STUDY

R-FCN abbrevation is “Region Based Fully Convolutional Networks” can be used for real time object detection . R-FCN is compared with R-CNNC. Using ResNet – 101.

This R- CNN assess a ten layer sub network for every part to get accuracy.

While R- FCN has insignificant per region cost.

Cascade R-CNN which stands for “Region-based Convolutional Neural Network” can be used for real time object detection. Cascade R-CNN is compared with iterative Bounding Box and integral loss detector.

If we consider evaluation metrics , R-CNN shows best performance if we consider iterative Bounding Box, it shows poor performance because single regressor is used which reduces localization, hypothesis of high IOU.

So cascade regressor shows better performance compared to iterative bounding box in IOU levels.

So basically all YOLO networks are executed in DarkNet, which is an example for open-source ANN library which is written in

The main difference between YOLO and SSD is that the YOLO architecture uses two fully connected layers, whereas in case of SSD network uses convolutional networks of different sizes i.e. varying sizes.

SSD stands for “Single Shot Detector” whereas YOLO stands for “You Look Only Once”. YOLO is a better option when you want the result quickly and exactness is not much disquiet.

VI. Conclusion

From all the above rferences we can conclude that this yolo v4 helps us to detect object in real with most accurate and more faster result. From the above comparative study we can say how R-CNN shows best performance in the analysis of object detection.And also we can see R- FCN is compared with R-CNNC. Using ResNet -101.we can see other the types of object detection software like yolo.s this yolo v4 contains many advance detection techniques that helps in detection of objects. We belive that this research paper will help others to further research on the object detection.

COMPARITIVE STUDY FOR OBJECT DETECTION

Title with authors	Journal and Year	Advantages	Disadvantages
R-FCN: Object detection via region based fully convolutional networks. Jifeng Dai, Yi Li	21st June 2016	The R-FCN network shows competitive result when residual net is used. When compared to faster R-CNN, the inference time of R-FCN is faster and it also maintains accuracy. This is done by using positive score map.	
Local loss for Dense Object Detection Tsung – Yi Lin	7th February 2018	Focal loss is particularly useful in cases where there is a class imbalance. Another example is the cases of object detection when most pixels are usually background and only very few pixels inside an image sometimes.	The primary obstacle in focal loss is there is a class imbalance which prevents object detectors that is one stage from giving top performance.
YOLO 4 Scaling Iron stage partial Chien Yoo Wong	22nd February 2021	The object detection using YOLO 4, neural network which is based on an approach called CSP. It is useful for both small and large networks.	The main disadvantage is it does not give proper result when it shows different aspects of ratio while detecting the object.
Cascade R-CNN: Delving into high quality object detection Zhar…. Cai		This paper proposes multi-stage object detection frame work. For getting design of high quality cascade R-CNN is used. Even in object detection architectures cascade R-CNN was applicable.	R-CNN training is a multistage pipeline and the training is much expensive and it consumes.

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