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Object Detection Using Yolov3

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ABSTRACT: Autonomous driving will increasingly require more and more dependable network-based mechanisms, requiring redundant, real-time implementations. Object detection is a growing field of research in the field of computer vision. The ability to identify and classify objects, either in a single scene or in more than one frame, has gained huge importance in a variety of ways, as while operating a vehicle, the operator could even lack attention that could lead to disastrous collisions. In attempt to improve these perceivable problems, the Autonomous Vehicles and ADAS (Advanced Driver Assistance System) have considered to handle the task of identifying and classifying objects, which in turn use deep learning techniques such as the Faster Regional Convoluted Neural Network (F-RCNN), the You Only Look Once Model (YOLO), the Single Shot Detector (SSD) etc. to improve the precision of object detection. YOLO is a powerful technique as it achieves high precision whilst being able to manage in real time. This paper explains the architecture and working of YOLO algorithm for the purpose of detecting and classifying objects, trained on the classes from COCO dataset.

KEYWORDS: yolov3 , coco , opencv.

I. INTRODUCTION

Quick, exact calculations for object detection would permit computer to drive vehicles without particular sensors, empower assistive gadgets to pass on constant scene data to human clients, and open the potential for universally useful, responsive automated frameworks. Object discovery includes identifying locale of interest of object from given class of picture. There are basically two algorithms for object discovery and they can be arranged into two kinds:

1. Classification-dependent algorithms are performed in two steps. First, they define and select areas of significance for an image. Second, these regions are organized into convolutional neural networks. The above-mentioned arrangement is mild, since it is required to make estimates for all chosen regions. A commonly recognized case of this type of algorithm is the Regional Convolutional Neural Network (RCNN) and Medium RCNN, Faster RCNN, and the most recent: Mask RCNN

2. Algorithms based on regression – rather than selecting a field of interest for an image, they estimate groups and bounding boxes for the whole picture in one run of the algorithm. The two most common models in this set are the YOLO family algorithms which provides maximum speed and precision for multiple object detection in a single frame and the SSD this algorithms that are typically used to track objects in real-time.

To understand the YOLO algorithm, it is important to determine what is currently expected. It varies from the majority of the neural network models because it uses a single convolutional network that predicts bounding boxes and the resulting probabilities. The bounding boxes are weighted by the probabilities and the model makes their detection dependent on the final weights. Thus, end-to-end output of the model can be directly maximized and, as a result, images can be produced and processed at a rapid pace[4]. Every bounding box can be represented using four descriptors:

1. Centre of a bounding box (bx, by)

2. Width (bw)

3. Height (bh)

4. Value ‘c’ refers to an object class

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The pc value also needs to be predicted, that indicates the likelihood that there is an object in the bounding box

OBJECT detection has been attracting increasing amounts of attention in recent years due to its wide range of applications and recent technological breakthroughs. This task is under extensive investigation in both academia and real world applications, such as monitoring security, autonomous driving, transportation surveillance, drone scene analysis, and robotic vision. Among many factors and efforts that lead to the fast evolution of object detection techniques, notable contributions should be attributed to the development of deep convolution neural networks and GPUs computing power. At present, deep learning model has been widely adopted in the whole field of computer vision, including general object detection and domain-specific object detection. Most of the state-of-the-art object detectors utilize deep learning networks as their backbone and detection network to extract features from input images (or videos), classification and localization respectively. Object detection is a computer technology related to computer vision and image processing which deals with detecting instances of semantic objects of a certain class (such as humans, buildings, or cars) in digital images and videos. Well-researched domains of object detection include multi-categories detection, edge detection, and salient object de-tection, pose detection, scene text detection, face detection, and pedestrian detection etc. As an important part of scene. understanding, object detection has been widely used in many fields of modern life, such as security field, military field, transportation field, medical field and life field. Furthermore, many benchmarks have played an important role in object detection field so far, such as Caltech [1], KITTI [2], ImageNet [3], PASCAL VOC [4], MS COCO [5], and Open Images V5 [6]. In ECCV VisDrone 2018 contest, organizers have released a novel drone platform-based dataset which contains a large amount of images and videos

II. LITERATURE SURVEY

Plenty of research has been conducted so far on the various available methods for implementation of an effective object detection system. These methods vary in terms of the types of input method used, the types of data processing employed and the controllers used to implement the systems. In this section looking for the various available solution with the advantages and disadvantages of each system. A fast and simple approach to detecting real time images was introduced in this paper as You Only Look Once. The model was built to detect images accurately, fast and to differentiate between art and real images.

1. Title-:You Only Look Once: Unified, Real-Time Object Detection

Author-:Joseph Redmon, Santosh Divvala, Ross Girshick, Ali Farhadi ,june 2016

Conclusion and result-:

In comparison with Object detection techniques that came before YOLO, like R-CNN, YOLO introduced a single unified architecture for regression go image into bounding boxes and finding class probabilities for each box. This meant that YOLO performed much faster and also provided more accuracy. It could also predict artwork correctly.

2. Title-:Object Detection Based on YOLO Network

Author-:Chengji Liu, Yufan Tao, Jiawei Liang, Kai Li1, Yihang Chen

Conclusion and result-:

The experiment showed that the model trained with the standard sets does not have good generalization ability for the degraded images and has poor robustness. Then the model was trained using degraded images which resulted in improved average precision. It was proved that the average precision for degraded images was better in general degenerative model compared to the standard model.

3.Title-:Pedestrian Detection Based on YOLO Network Model

Author-:Wenbo Lan, Jianwu Dang, Yang-ping Wang, Song Wang

Conclusion and result-:

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The YOLO v2 and YOLO-R network models were tested on the test set of the INRIA data set. The experimental results show that the YOLO-R network model is superior to the original YOLO v2 network model. The number of detection frames reached 25 frames/s, basically meeting the requirement of real-time perform

III. YOLOV3

YOLOv3:The most current of the main versions is the third iteration of the approach, namely YOLOv3. In each version improvements have been made over the previous one. The initial version proposed the general architecture, after which the second variation improved accuracy significantly while making it faster. YOLOv3 refined the design further by using tricks, such as multi-scale prediction and bounding box prediction through the use of logistic regression. While the accuracy increased dramatically with this version, it traded off against speed which reduced from 45 to 30 frames per second. YOLOv3 uses a variant of Darknet, a framework to train neural networks, which originally has 53 layers. For the detection task another 53 layers are stacked onto it, accumulating to a total of a 106-layer fully convolutional architecture. This explains the reduction in speed in comparison with the second version, which only has 30 layers.

IV. ISSUE WITH EXISTING SOLUTIONS

1. Dual priorities: object classification and localization

The first major complication of object detection is its added goal: not only do we want to classify image objects but also to determine the objects' positions, generally referred to as the *object localization* task. To address this issue, researchers most often use a multi-task loss function to penalize both misclassifications and localization errors.

2. Speed for real-time detection

Object detection algorithms need to not only accurately classify and localize important objects, they also need to be incredibly fast at prediction time to meet the real-time demands of video processing. Several key enhancements over the years have boosted the speed of these algorithms, improving test time from the 0.02 frames per second (fps) of R-CNN to the impressive 155 fps of Fast YOLO.

3. Multiple spatial scales and aspect ratios

For many applications of object detection, items of interest may appear in a wide range of sizes and aspect ratios. Practitioners leverage several techniques to ensure detection algorithms are able to capture objects at multiple scales and views.

V. PROBLEM STATEMENT

Most of the security companies and video detecting agencies use analog method of detection, to reduce the complexity and physical work and to detect the real time image this model is proposed with technical and economical feasibility.

VI. PROPOSED SYSTEMS

The objectives for creating this system are:

- Detect real time objects
- Can implement it in the traffic system by governments
- Easy detection of criminals and fugitives.

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VII. GOALS

The aim of this model is to implement a Fully automated object detection system which will be a cost-effective, one-time investment, currently where world is moving towards virtual working trends this model will provide accurate results.

VIII. ADVANTAGES

- Fully Automated object detection System with live object detection
- Secure and Confidential.
- Reduce Contagion.

IX. FUTURE ENHANCEMENTS

- The future enhancement development will be concentrating more on accuracy of the detected image
- We are planning to integrate this model with face recognized security systems.. .
- We are working to optimize the algorithm to recognize in any kind of environment.

X. CONCLUSION

By using object detection system the process of cdetecting the images from a live feed a is automated and human errors are avoided.

- Its installation is easy and hence does not require professionals for the same.
- The object detection system is easy to use.
- object detection is reliable and easy to use.

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XI. RESULT

The project has been implemented aspython output. Also different attributes have been added to the project which will prove to be advantageous to the system.

REFERENCES

[1] 1.Xun. Li, Yao. Liu, Zhengfan. Zhao, Y. Zhang, and L. He, “A Deep Learning Approach of Vehicle Multitarget Detection from Traffic Video,” Journal of Advanced Transportation, vol. 2018, pp. 1–11, Nov. 2018.

[2] Rachel Huang, J. Pedoeem, and Cuixian. Chen, “YOLO-LITE: A Real-Time ObjectDetection Algorithm Optimized for Non-Graphical Processing Unit Computers,” 2018 IEEE International Conference on Big Data (Big Data), Dec. 2018.

[3] Shuoyuan. Xu, A. Savvaris, S. He, H. Shin, and Antonios Tsourdos, “Real-time Implementation of YOLO+JPDA for Small Scale UAV Multiple Object Tracking,” 2018 International Conference on Unmanned Aircraft Systems (ICUAS), Jun. 2018.

[4] Dnise Vorobjov, Iryna Zakharava, R. Bohush, and S. Ablameyko, "An Effective Object Detection Algorithm for High-Resolution Video by Using CNN," Lecture Notes in Computer Science, pp. 503–510, 2018 [5]

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