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RESEARCH ARTICLE

OBJECT DETECTION USING YOLO ALGORITHM

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Abstract

Object detection is a task in computer vision that involves identifying and locating objects in an image or video. YOLO (You Only Look Once) is a popular algorithm used for object detection. The YOLO algorithm is a single-shot detector that uses a convolutional neural network (CNN) to detect objects in an image or video. It divides the input image into a grid of cells, and each cell is responsible for predicting the presence of a specific object. The algorithm uses a combination of anchor boxes, objectness scores, and class probabilities to make predictions. The YOLO algorithm is known for its fast processing time and high In this paper, we present an overview of the YOLO algorithm for object detection and its various applications. We discuss the architecture of the YOLO network and the key components that make it an efficient and effective object detector.

Keywords: yolo algorithm, , neural network, processing, analysis

Introduction

Object detection is combination of both objects Classification and object Localization. Dark Net is an Open-source Deep Learning frame-work for training and datasets. Bounding Box approach is used to detection of objects present in the frame. Tracking of the objects is based on the centroid of the object using centroid tracker. Tkinter in python language used to develop the graphical user interface. Earlier detection frameworks, looked at different parts of the image multiple times at different scales and repurposed image classification technique to detect objects. This approach is slow and inefficient. YOLO takes entirely different approach. It looks at the entire image only once and goes through the network once and detects objects. Hence the name. It is very fast. That's the reason it has got so popular.

There are other popular object detection frameworks like Faster R-CNN and SSD that are also widely used. In this post, we are going to look at how to use a pre-trained YOLO model with OpenCV and start detecting objects right away. Overall, the YOLO algorithm has proven to be a valuable tool for object detection in many applications such as surveillance, autonomous driving, and image captioning. With its

fast processing time and high accuracy, it has become a popular choice for many computer vision projects.

Table 1: A breakdown of YOLO variations by years

	YOLO V2	YOLO V3	YOLO V4	YOLO V5	Total
2016	0	0	0	0	0
2017	5	0	0	0	5
2018	48	18	0	0	66
2019	49	210	0	0	259
2020	37	495	80	16	628
Total	135	726	80	12	953

op ten searches for each YOLO version are listed in Table 2. (V2 and V3)

YOLO V2		YOLO V3	
GOOGLE	**YOUTUBE**	**GOOGLE**	**YOUTUBE**
yolo v2	yolo v2	yolo v3	yolo v3
yolo v2	yolo v2	yolo v3	yolo v3 vs v4
paper	matlab	paper	
yolo v2 architecture	yolo v2 object detection	yolo v3 github	yolo v3 training
yolo v2 github	yolov2 pytorch	Yolov3 pytorch	yolo v3 demo
yolo v2 pytorch	yolo v2 loss function	yolo v3 vs v4	yolo v3 object detection

Table 3. Top ten queries for each YOLO version (V4 and V5)

YOLO V4		YOLO V5	
GOOGLE	**YOUTUBE**	**GOOGLE**	**YOUTUBE**
yolo v4	yolo v4	yolo v5	yolo v5
yolo v4 alexeyab	yolo v4 tutorial	yolo v5 github	yolo v5 vs v4
yolo v4 github	yolo v4 demo	yolo v5 paper	yolo v5 tutorial
yolo v4	yolo v4	yolo v5	yolo v5

pytorch	video	tutorial	object detection
yolo v4 tiny	yolo v4 colab	yolo v5 vs v4	yolo v5 colab
yolo v4 vs v5	yolo v4 tiny	yolo v5 architecture	yolo v5 demo
yolo v4 tensorflow	yolo v4 google colab	yolo v5 darknet	yolo v5 video
yolo v4 tutorial	yolo v4 object detection	yolo v5 tensorflow	yolo v5 pytorch
yolo v4 python	yolo v4 training	yolo v5 tensorflow github	yolo v5 paper
yolo v4 training	yolo v4 tensorflow	yolo v5 tensorrt	yolo v5 architecture

Design and Methodologies

1. Yolo Algorithm

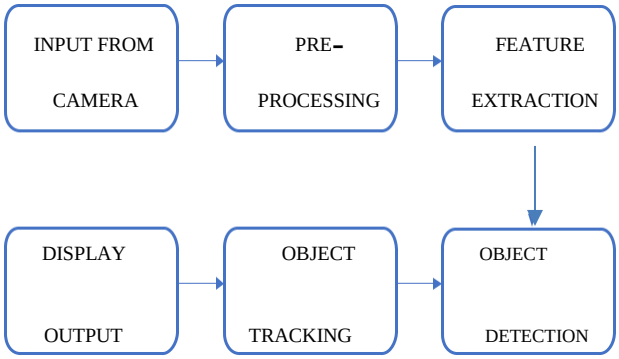
Yolo algorithm uses darknet-yolov5.cfg It is used for training in DarkNet to predict object's class probabilities and bounding box coordinates.

2. Object traking (extended module)

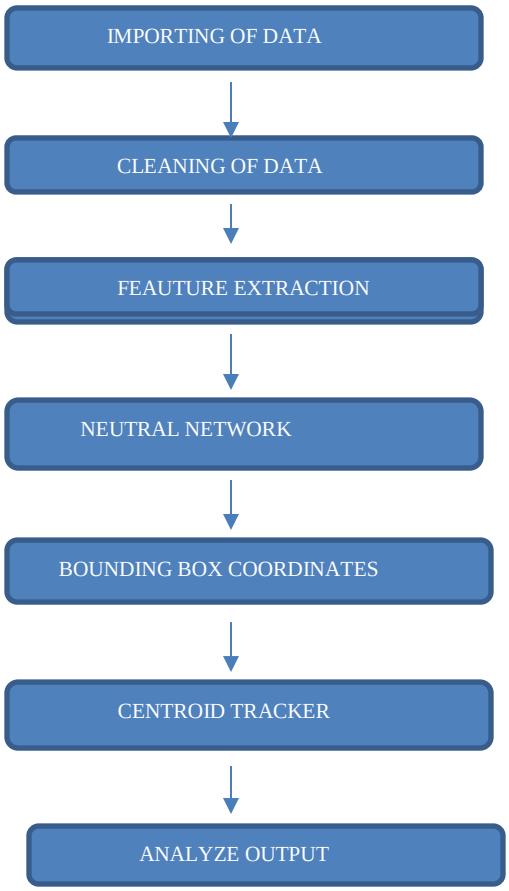
Centroid tracker is used for tracking objects. It is consist of methods update, register, and de-register to track objects in frame.Each object is assigned with id value.

Implementtion

Architecture Diagram



Data Flow Diagram



Result

Input **Output**

Car was detected with confidence value of 0.974 (97%) and the ID value assigned is 0 tracking.

Conclusion

Proposed system for object detection and tracking had the accuracy above 90% confidence. Low cost, scalable, user-friendly, Robust solution for the application of the lane detection purposes. This paper gives us a review of the YOLO versions. Here we draw the following remarks. First, the YOLO version has a lot of differences. However, they still have some features in common. Hence, they are still similar. Second. The YOLO versions are still very new, have a lot of room for future research. Especially for scenario implementations. There is still room for future improvement. This paper can focus more on the implementations comparing, such as scenario analysis. Further, the research for YOLO V1 is very limited in this paper. For example, in the trend subsection, both the figure and tabular have ignored YOLO V1. Future research can do better on this point.

Reference

1. Sultana, F., Sufian, A and Dutta, P. (2020). A review of object detection models based on convolutional neural network. Intelligent Computing: Image Processing Based Applications, 1-16.
2. Zhiqiang, W and Jun, L. (2017). A review of object detection based on convolutional neural network. In 2017 36th Chinese Control Conference (CCC) (pp. 11104-11109). IEEE.
3. Zhao, Z. Q., Zheng, P. Xu, S. T and Wu, X. (2019). Object detection with deep learning: A review. IEEE transactions on neural networks and learning systems, 30(11), 3212-3232.
4. Zou, X. (2019). A Review of Object Detection Techniques. In 2019 International Conference on Smart Grid and Electrical Automation (ICSGEA) (pp. 251-254). IEEE.
5. Laroca, R., Severo, E. Zanlorensi, L. A. Oliveira, L. S. Gonçalves, G. R. Schwartz, W. R. and Menotti, D. (2018). A robust realtime automatic license plate recognition based on the YOLO detector. In 2018 International Joint Conference on Neural Networks (IJCNN) (pp. 1-10). IEEE.
6. Tian, Y., Yang, G. Wang, Z. Wang, H. Li, E and Liang, Z. (2019). Apple detection during different growth stages in orchards using the improved YOLO-V3 model. Computers and electronics in agriculture, 157, 417-426.
7. Jamtsho, Y., Riyamongkol, P an Waranusast, R. (2021). Real-time license plate detection for non- helmeted motorcyclist using YOLO. ICT Express, 7(1), 104-109.
8. Han, J., Liao, Y. Zhang, J. Wang, S and Li, S. (2018). Target fusion detection of LiDAR and camera based on the improved YOLO algorithm. Mathematics, 6(10), 213.

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