

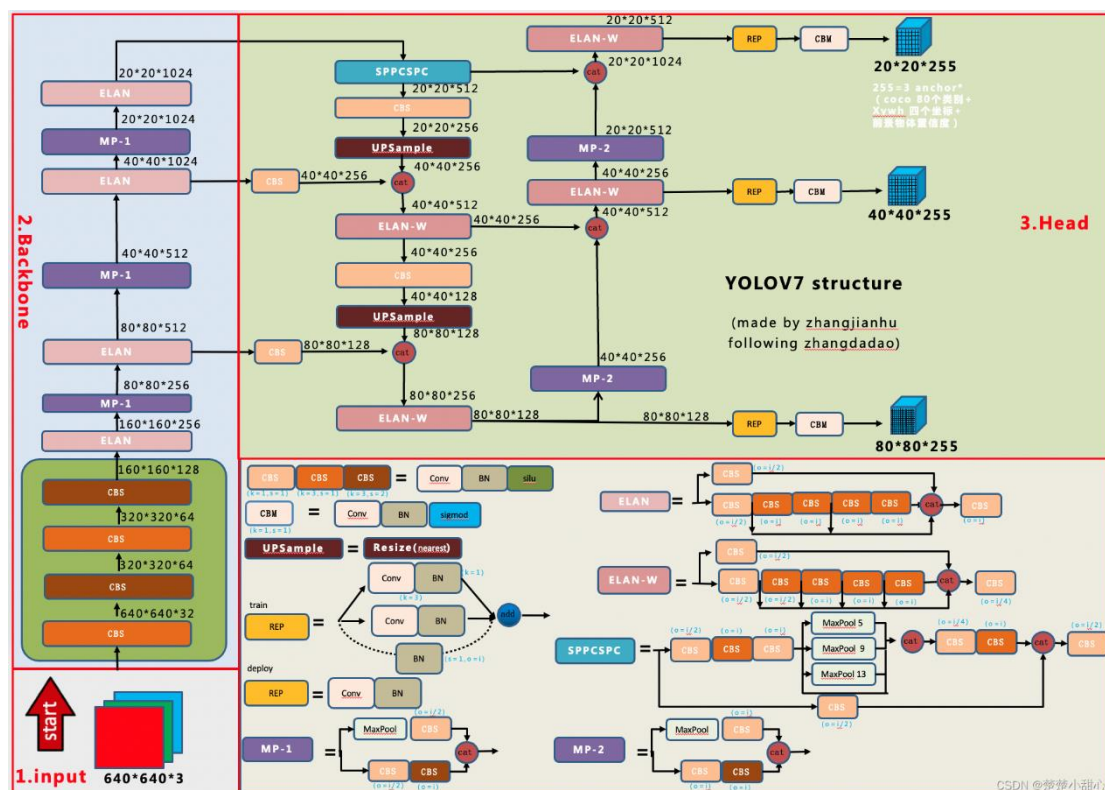
## CVPDL\_HW1

r11922150 游鈞皓

1. (5%) Draw the architectures for both CNN-based and Transformer-based methods

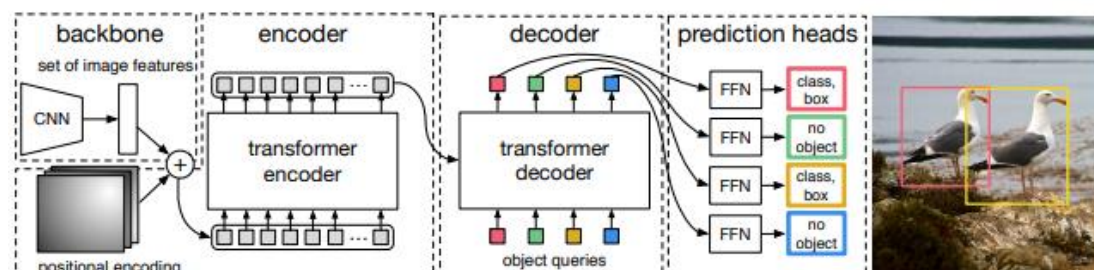
- The graph should be brief and clear
- It would be fine to straight copy the figure from the paper

CNN-based method: YOLOv7



( Image source: <https://blog.csdn.net/qq128252/article/details/126673493> )

## Transformer-based method: DETR



( Image source: <https://arxiv.org/pdf/2005.12872.pdf> )

## 2. (10%) Report and compare the performance of two methods on validation set

a. at least with mAP@[50:5:95], mAP@50, mAP@75

b. use table to organize the results

	mAP@[50:5:95]	mAP@50	mAP@75	mAP small	mAP medium	mAP large
YOLOv7	0.527	0.817	0.557	0.229	0.396	0.654
DETR	0.418	0.735	0.403	0.118	0.314	0.557

## 3. (10%) Report the implementation details of both methods

a. Ex: augmentation, loss function, cross validation method, ...etc.

### YOLOv7

**fine-tune with yolov7.pt**

epochs	300
lr	0.01
weight_decay	0.0005
Optimizer	SGD
Augmentation	hsv_h: 0.015, hsv_s: 0.7, hsv_v: 0.4 degrees: 0.0, translate: 0.2, scale: 0.9 shear: 0.0, perspective: 0.0 flipud: 0.0, fliplr: 0.5 mosaic: 1.0, mixup: 0.15 copy_paste: 0.0, paste_in: 0.15
Loss function	L1loss for lbox, BCEWithLogitsLoss for lobj and lcls

### DETR

**fine-tune with detr-r50**

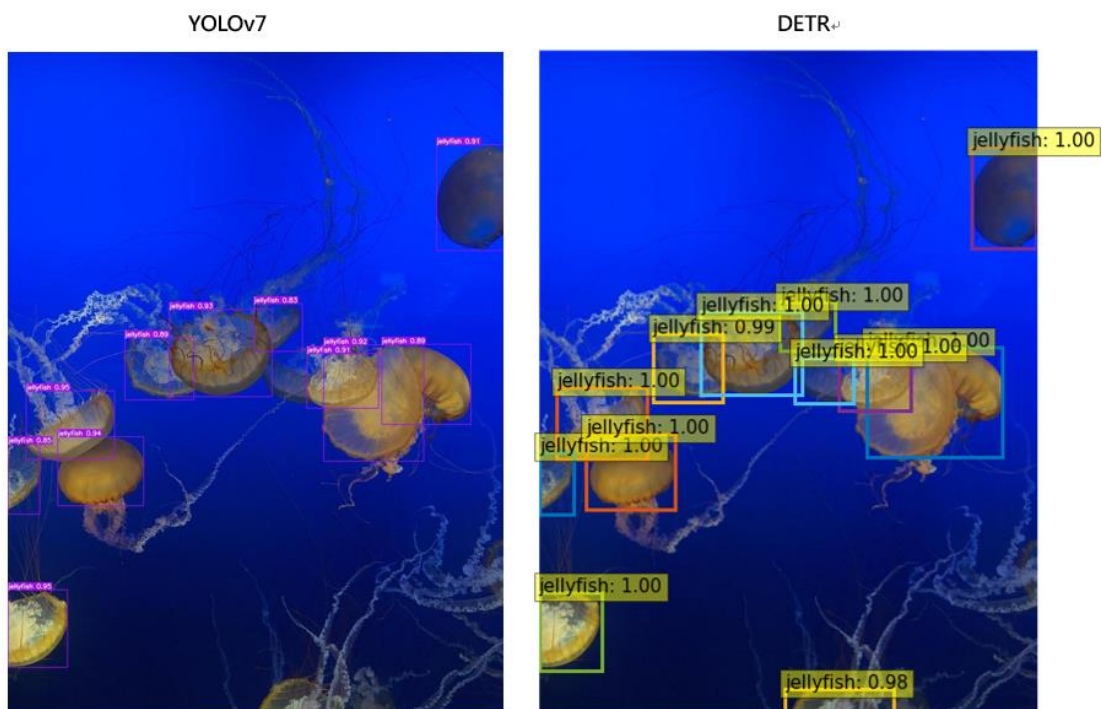
epochs	100 + 300
lr	1e-4
weight_decay	1e-4
Dropout	0.1
Grad clip	0.1
Optimizer	AdamW

Augmentation	Horizontal flips, scales and crops
Loss function	Cross-entropy of class + L1 loss of bounding box + generalized IoU loss of bounding box

4. (5%) Visualization: draw the bounding boxes of two methods on this test image.

a. IMG\_2574.jpeg.jpg.rf.ca0c3ad32384309a61e92d9a8bef87b9

b. Result should be something like this



## Reference

1. Detr: [woctezuma/finetune-detr: Fine-tune Facebook's DETR \(DEtection Transformer\) on Colaboratory. \(github.com\)](https://github.com/woctezuma/finetune-detr)
2. YOLOv7: [WongKinYiu/yolov7: Implementation of paper - YOLOv7: Trainable bag-of-freebies sets new state-of-the-art for real-time object detectors \(github.com\)](https://github.com/WongKinYiu/yolov7)