Computer Vision hw4

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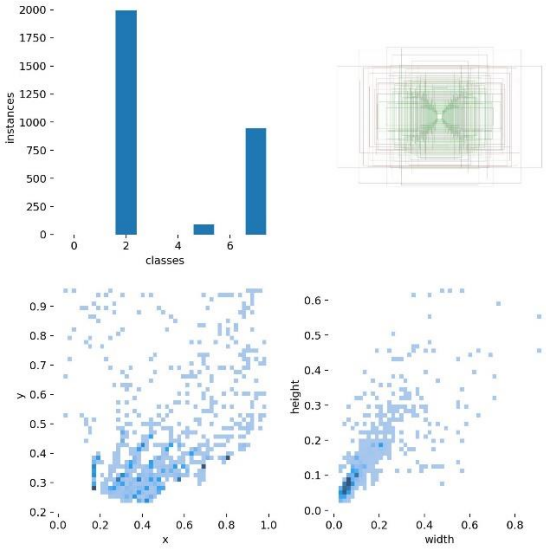
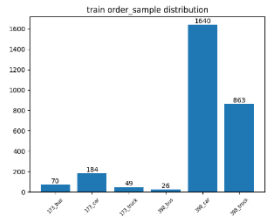
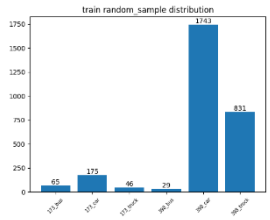
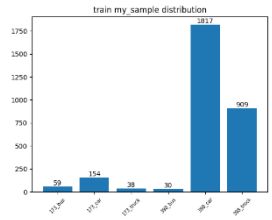
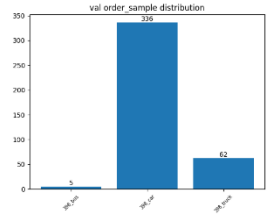
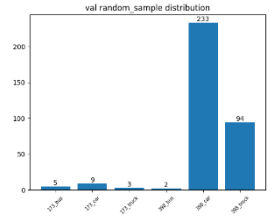
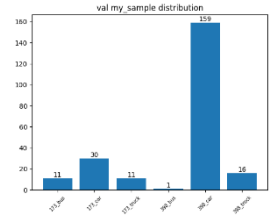
Q1

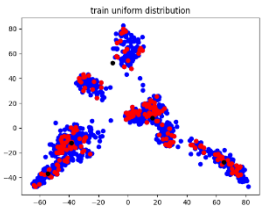
See the following figure, the classes 5 and 7 are less than the class 2. Therefore, I calculate the count of the class 5 and 7 every image and get the proportion of training set from large to small. The rest of the images are the valid set.



	Order_sample	Random_sample	My_sample
Train_distribution			
Val_distribution			
mAP@.5:.95 all car bus truck	0.399 0.431 0.449 0.317	0.391 0.426 0.473 0.274	0.402 0.443 0.434 0.328

Q2

- Firstly, I use the VGG16 to extract features.
- I used PCA to reduce the dimension to 128.
- I use Kmeans to cluster into 5 clusters.
- I use uniform sample in every cluster.

	Random_sample	My_method
Selected	-	
mAP@.5:.95 all car bus truck	0.479 0.511 0.51 0.418	0.489 0.517 0.536 0.414

Q3

- Firstly, I used the pretrained weight on Q2 to generate the pseudo label on Q3.
- Train on 200 label data (Q2) and 1200 pseudo label data (Q3)
- Finetune on Q2 dataset.
- Finetune on Q2 dataset with focal loss.

	Pseudo_label	Pseudo_label_finetune	Pseudo_label_finetune _focal_loss
mAP@.5:.95 all car bus truck	0.515 0.515 0.574 0.454	0.519 0.521 0.58 0.457	0.524 0.523 0.589 0.459