

Aero2Astro

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I had trained pp_yolo v2 model upto 1455 epochs. The minimum loss is 16 and it's still fluctuates in between 16 to 30.

Evaluated with both training and test datasets, the mAP increased with compared to previous checkpoints.

Previous model Evaluation Result (PP -Yolo v1 1000 ins , bs = 4, lr = 0.0002)

Training Data:

```
Accumulating evaluation results...
DONE (t=0.85s).
Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.454
Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.751
Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.499
Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.359
Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.588
Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.579
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.173
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.479
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.580
Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.498
Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.699
Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.710
[08/15 07:11:53] ppdet.metrics.coco_utils INFO: Per-category of bbox AP:
+-----+-----+-----+-----+-----+
| category | AP | category | AP | category | AP |
+-----+-----+-----+-----+-----+
| bird | 0.451 | book | 0.315 | bottle | 0.601 |
| car | 0.173 | chair | 0.616 | person | 0.567 |
+-----+-----+-----+-----+-----+
[08/15 07:11:53] ppdet.metrics.coco_utils INFO: per-category PR curve has output to bbox
[08/15 07:11:53] ppdet.engine INFO: Total sample number: 1093, average FPS: 18.4354342262
```

Test Data:

```
Accumulating evaluation results...
DONE (t=0.15s).
Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.056
Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.113
Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.049
Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.044
Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.066
Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.130
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.051
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.134
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.179
Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.144
Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.231
Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.201
[08/13 14:25:45] ppdet.metrics.coco_utils INFO: Per-category of bbox AP:
+-----+-----+-----+-----+-----+
| category | AP | category | AP | category | AP |
+-----+-----+-----+-----+-----+
| bird | 0.146 | book | 0.007 | bottle | 0.175 |
| car | 0.007 | person | 0.000 | chair | 0.000 |
+-----+-----+-----+-----+-----+
[08/13 14:25:45] ppdet.metrics.coco_utils INFO: per-category PR curve has output to bbox_pr_curve folder.
[08/13 14:25:45] ppdet.engine INFO: Total sample number: 177, average FPS: 18.61171957113853
```

Current Model(PP-yolo v2 500 ins , bs=8, lr=0.0002)

Training Data :

```
Accumulating evaluation results...
DONE (t=0.70s).
Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.572
Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.926
Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.641
Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.478
Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.681
Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.705
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.248
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.627
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.706
Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.616
Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.788
Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.827
[08/15 07:17:04] ppdet.metrics.coco_utils INFO: Per-category of bbox AP:
+-----+-----+-----+-----+-----+
| category | AP | category | AP | category | AP |
+-----+-----+-----+-----+-----+
| aeroplane | 0.632 | car | 0.546 | chair | 0.587 |
| cow | 0.639 | person | 0.553 | traffic_light | 0.477 |
+-----+-----+-----+-----+-----+
[08/15 07:17:04] ppdet.metrics.coco_utils INFO: per-category PR curve has output to bbox_pr_curve folder.
[08/15 07:17:04] ppdet.engine INFO: Total sample number: 689, average FPS: 11.891761248375017
```

Test Data :

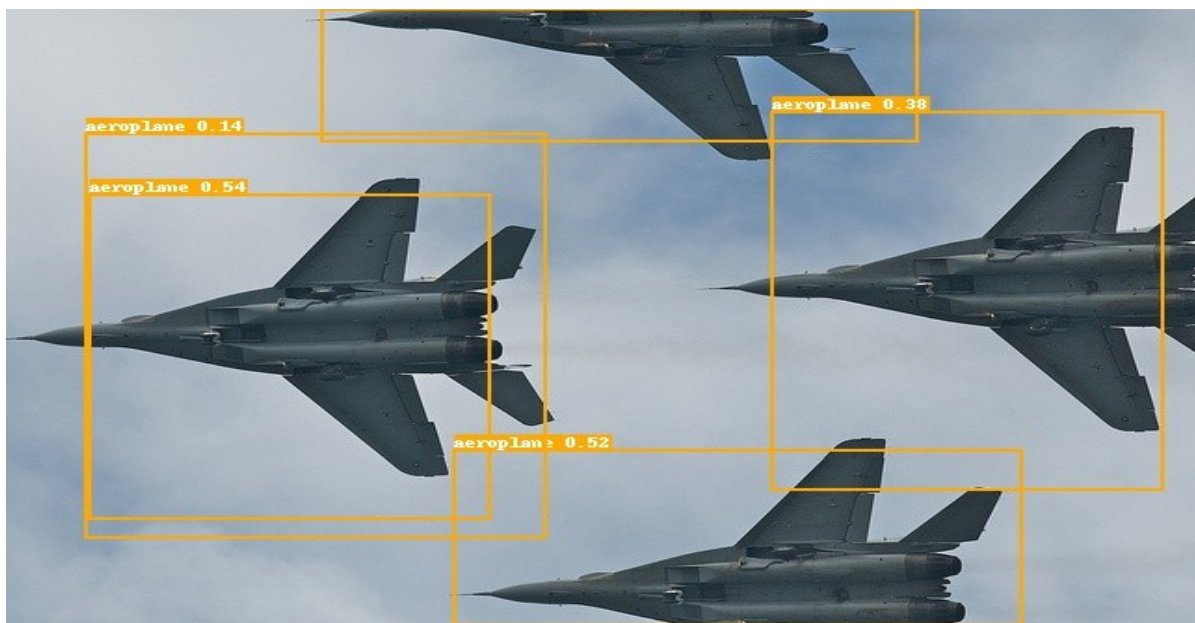
```
Evaluate annotation type *bbox*
DONE (t=1.68s).
Accumulating evaluation results...
DONE (t=0.20s).
Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.194
Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.368
Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.173
Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.121
Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.256
Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.318
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.140
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.335
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.413
Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.267
Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.488
Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.678
[08/15 07:20:38] ppdet.metrics.coco_utils INFO: Per-category of bbox AP:
+-----+-----+-----+-----+-----+
| category | AP | category | AP | category | AP |
+-----+-----+-----+-----+-----+
| aeroplane | 0.346 | car | 0.103 | chair | 0.117 |
| cow | 0.358 | person | 0.068 | traffic_light | 0.171 |
+-----+-----+-----+-----+-----+
[08/15 07:20:38] ppdet.metrics.coco_utils INFO: per-category PR curve has output to bbox_pr_c
[08/15 07:20:38] ppdet.engine INFO: Total sample number: 190, average FPS: 4.517461871323083
```


Model Inference Speed:(test data)

```
class_id:5, confidence:0.7655, left_top:[3.85,43.22],right_bottom:[29.85,94.51]  
class_id:5, confidence:0.6774, left_top:[24.88,231.26],right_bottom:[30.19,242.98]  
class_id:5, confidence:0.6466, left_top:[76.79,115.94],right_bottom:[107.86,191.37]  
save result to: output/images/COCO_val2014_000000033731.jpg  
----- Inference Time Info -----  
total_time(ms): 667111.1, img_num: 229  
average latency time(ms): 2913.15, QPS: 0.343271  
preprocess_time(ms): 106.40, inference_time(ms): 2806.80, postprocess_time(ms): 0.00
```

Detection result:

Threshold = 0.1







Notebook link :

https://github.com/Panneer003/Aero2astro_code/blob/main/PP_Yolo_with_official/pp_yolo_v2_500ins_until_aug_14.ipynb