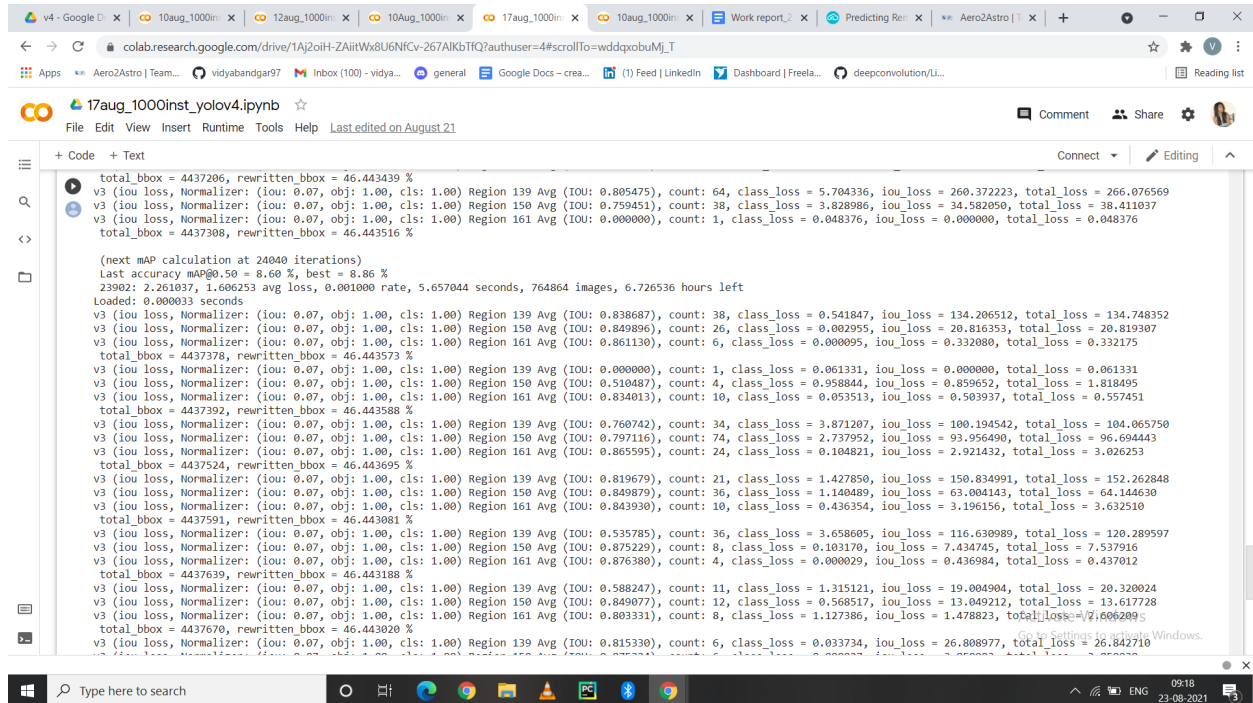


# Work report

21 Aug 2021

yolov4 for 1000 instances.

Epochs 23902



```
total_bbox = 4437286, rewritten_bbox = 46.443439 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.805475), count: 64, class_loss = 5.704336, iou_loss = 260.372223, total_loss = 266.076569
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.759451), count: 38, class_loss = 3.828986, iou_loss = 34.582050, total_loss = 38.411837
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.000000), count: 1, class_loss = 0.048376, iou_loss = 0.000000, total_loss = 0.048376
total_bbox = 4437308, rewritten_bbox = 46.443516 %

(next mAP calculation at 24040 iterations)
last accuracy mAP@0.50 = 8.60 %, best = 8.86 %
23902: 2.261837, 1.606253 avg loss, 0.001000 rate, 5.657044 seconds, 764864 images, 6.726536 hours left
Loaded: 0.000033 seconds
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.838687), count: 38, class_loss = 0.541847, iou_loss = 134.206512, total_loss = 134.748352
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.849896), count: 26, class_loss = 0.062955, iou_loss = 20.816353, total_loss = 20.819307
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.861130), count: 6, class_loss = 0.000095, iou_loss = 0.332080, total_loss = 0.332175
total_bbox = 4437378, rewritten_bbox = 46.443573 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.000000), count: 1, class_loss = 0.061331, iou_loss = 0.000000, total_loss = 0.061331
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.510487), count: 4, class_loss = 0.958844, iou_loss = 0.859652, total_loss = 1.818495
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.834013), count: 10, class_loss = 0.053513, iou_loss = 0.503937, total_loss = 0.557451
total_bbox = 4437392, rewritten_bbox = 46.443588 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.760742), count: 34, class_loss = 3.871207, iou_loss = 100.194542, total_loss = 104.065750
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.797116), count: 74, class_loss = 2.737952, iou_loss = 93.956490, total_loss = 96.694443
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.865595), count: 24, class_loss = 0.104821, iou_loss = 2.921432, total_loss = 3.026253
total_bbox = 4437524, rewritten_bbox = 46.443695 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.819679), count: 21, class_loss = 1.427850, iou_loss = 150.834991, total_loss = 152.262848
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.849879), count: 36, class_loss = 1.140489, iou_loss = 63.004143, total_loss = 64.144630
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.843930), count: 10, class_loss = 0.436354, iou_loss = 3.196156, total_loss = 3.632510
total_bbox = 4437591, rewritten_bbox = 46.443081 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.535785), count: 36, class_loss = 3.658605, iou_loss = 116.630989, total_loss = 120.289597
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.875229), count: 8, class_loss = 0.103170, iou_loss = 7.434745, total_loss = 7.537916
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.876380), count: 4, class_loss = 0.000029, iou_loss = 0.436984, total_loss = 0.437012
total_bbox = 4437630, rewritten_bbox = 46.443188 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.588247), count: 11, class_loss = 1.315121, iou_loss = 19.004904, total_loss = 20.320024
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.849077), count: 12, class_loss = 0.568517, iou_loss = 13.049212, total_loss = 13.617728
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.803331), count: 8, class_loss = 1.127386, iou_loss = 1.478823, total_loss = 2.606209
total_bbox = 4437670, rewritten_bbox = 46.443020 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.815330), count: 6, class_loss = 0.033734, iou_loss = 26.808977, total_loss = 26.842710
```

## Map

### 1.train

calculation mAP (mean average precision)...

Detection layer: 139 - type = 28

Detection layer: 150 - type = 28

Detection layer: 161 - type = 28

1192

detections\_count = 23164, unique\_truth\_count = 9852

class\_id = 0, name = bird, ap = 82.13% (TP = 340, FP = 108)

class\_id = 1, name = book, ap = 75.90% (TP = 757, FP = 247)

class\_id = 2, name = bottle, ap = 93.74% (TP = 937, FP = 144)

class\_id = 3, name = car, ap = 88.65% (TP = 4756, FP = 785)

class\_id = 4, name = person, ap = 97.59% (TP = 972, FP = 117)

class\_id = 5, name = chair, ap = 95.10% (TP = 941, FP = 107)

for conf\_thresh = 0.25, precision = 0.85, recall = 0.88, F1-score = 0.87

for conf\_thresh = 0.25, TP = 8703, FP = 1508, FN = 1149, average IoU = 70.23 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall

mean average precision (mAP@0.50) = 0.888526, or 88.85 %

Total Detection Time: 872 Seconds

## 2. Test

```
-----
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
180
detections_count = 3269, unique_truth_count = 1995
class_id = 0, name = bird, ap = 13.65%      (TP = 36, FP = 29)
class_id = 1, name = book, ap = 0.13%      (TP = 2, FP = 85)
class_id = 2, name = bottle, ap = 15.31%   (TP = 47, FP = 60)
class_id = 3, name = car, ap = 5.65%       (TP = 147, FP = 354)
class_id = 4, name = chair, ap = 10.90%    (TP = 26, FP = 75)
class_id = 5, name = person, ap = 6.33%    (TP = 16, FP = 68)

for conf_thresh = 0.25, precision = 0.29, recall = 0.14, F1-score = 0.19
for conf_thresh = 0.25, TP = 274, FP = 671, FN = 1721, average IoU = 22.51 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.086613, or 8.66 %
Total Detection Time: 136 Seconds
```

## MAP(20.08.2021)

### 1. train :

```
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
1192
detections_count = 22300, unique_truth_count = 9852
class_id = 0, name = bird, ap = 79.13%     (TP = 326, FP = 103)
class_id = 1, name = book, ap = 70.36%     (TP = 712, FP = 284)
class_id = 2, name = bottle, ap = 92.46%   (TP = 919, FP = 117)
class_id = 3, name = car, ap = 86.96%      (TP = 4646, FP = 694)
class_id = 4, name = person, ap = 97.15%   (TP = 961, FP = 58)
class_id = 5, name = chair, ap = 95.14%    (TP = 938, FP = 73)

for conf_thresh = 0.25, precision = 0.86, recall = 0.86, F1-score = 0.86
for conf_thresh = 0.25, TP = 8502, FP = 1329, FN = 1350, average IoU = 71.00 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.868669, or 86.87 %
Total Detection Time: 691 Seconds
```

## 2. test

```
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
180
detections_count = 2914, unique_truth_count = 1995
class_id = 0, name = bird, ap = 16.91%      (TP = 40, FP = 27)
class_id = 1, name = book, ap = 0.18%      (TP = 3, FP = 75)
class_id = 2, name = bottle, ap = 15.75%    (TP = 49, FP = 60)
class_id = 3, name = car, ap = 6.15%       (TP = 151, FP = 315)
class_id = 4, name = chair, ap = 9.74%     (TP = 26, FP = 61)
class_id = 5, name = person, ap = 7.07%    (TP = 19, FP = 63)

for conf_thresh = 0.25, precision = 0.32, recall = 0.14, F1-score = 0.20
for conf_thresh = 0.25, TP = 288, FP = 601, FN = 1707, average IoU = 25.34 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.092996, or 9.30 %
Total Detection Time: 104 Seconds
```

## Pp-yolo for 1000 instances

```
DONE (t=0.77s)
creating index...
index created!
Running per image evaluation...
Evaluate annotation type *bbox*
DONE (t=7.72s).
Accumulating evaluation results...
DONE (t=1.40s).
Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.039
Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.111
Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.017
Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.037
Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.051
Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.031
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.047
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.147
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.210
Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.160
Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.260
Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.243
[08/14 05:42:22] ppdet.metrics.coco_utils INFO: Per-category of bbox AP:
+-----+-----+-----+-----+
| category | AP | category | AP | category | AP |
+-----+-----+-----+-----+
| bird | 0.011 | book | 0.015 | bottle | 0.124 |
| car | 0.002 | chair | 0.016 | person | 0.064 |
+-----+-----+-----+-----+
[08/14 05:42:22] ppdet.metrics.coco_utils INFO: per-category PR curve has output to bbox_pr_curve folder.
[08/14 05:42:23] ppdet.engine INFO: Total sample number: 1093, average FPS: 13.546782759184328
```