

# Work report

20 Aug 2021

yolov4 for 1000 instances.

Epochs 19144

```
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.828151), count: 2, class_loss = 0.578468, iou_loss = 0.429429, total_loss = 1.007897)
total_bbox = 771238, rewritten_bbox = 46.306068 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.731735), count: 10, class_loss = 0.541197, iou_loss = 56.964745, total_loss = 57.505943)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.861341), count: 14, class_loss = 1.196942, iou_loss = 24.477646, total_loss = 25.674587)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.799603), count: 12, class_loss = 1.624595, iou_loss = 2.633132, total_loss = 4.257727)
total_bbox = 771274, rewritten_bbox = 46.305073 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.768617), count: 10, class_loss = 0.062552, iou_loss = 24.232208, total_loss = 24.294760)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.852865), count: 12, class_loss = 0.553157, iou_loss = 17.672438, total_loss = 18.225595)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.785069), count: 10, class_loss = 0.634975, iou_loss = 0.577698, total_loss = 1.212673)
total_bbox = 771306, rewritten_bbox = 46.305229 %

(next mAP calculation at 19288 iterations)
last accuracy mAP@0.50 = 9.35 %, best = 9.35 %
19144: 2.537990, 2.138659 avg loss, 0.001000 rate, 10.678397 seconds, 612608 images, 25.573486 hours left
Loaded: 0.000038 seconds
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.763604), count: 16, class_loss = 2.190279, iou_loss = 66.383469, total_loss = 68.573746)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.834681), count: 18, class_loss = 1.381303, iou_loss = 12.043485, total_loss = 13.424788)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.841823), count: 19, class_loss = 0.540428, iou_loss = 3.747551, total_loss = 4.287979)
total_bbox = 771359, rewritten_bbox = 46.304768 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.777810), count: 10, class_loss = 0.244263, iou_loss = 12.803794, total_loss = 13.048058)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.805878), count: 28, class_loss = 0.470264, iou_loss = 11.738013, total_loss = 12.200276)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.830758), count: 18, class_loss = 0.869244, iou_loss = 2.808595, total_loss = 3.677838)
total_bbox = 771415, rewritten_bbox = 46.305298 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.751172), count: 55, class_loss = 3.924299, iou_loss = 555.053650, total_loss = 558.977966)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.802438), count: 35, class_loss = 1.831721, iou_loss = 25.802351, total_loss = 27.634071)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.868863), count: 19, class_loss = 0.313368, iou_loss = 4.621472, total_loss = 4.934839)
total_bbox = 771524, rewritten_bbox = 46.306271 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.807109), count: 34, class_loss = 2.061292, iou_loss = 127.446198, total_loss = 129.507492)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.850681), count: 43, class_loss = 2.341606, iou_loss = 34.136417, total_loss = 36.478024)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.871866), count: 15, class_loss = 0.438025, iou_loss = 2.652015, total_loss = 3.090040)
total_bbox = 771616, rewritten_bbox = 46.305157 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.842061), count: 4, class_loss = 0.001119, iou_loss = 6.993794, total_loss = 6.994914)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.885837), count: 4, class_loss = 0.001509, iou_loss = 4.548388, total_loss = 4.549896)
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.900000), count: 1, class_loss = 0.010158, iou_loss = 0.000000, total_loss = 0.010158)
total_bbox = 771624, rewritten_bbox = 46.305195 %

✓ Os completed at 6:40 PM
```

## 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 = 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
```

## MAP(19.08.2021)

### 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 = 37022, unique_truth_count = 9852
class_id = 0, name = bird, ap = 72.63%     (TP = 334, FP = 368)
class_id = 1, name = book, ap = 68.23%     (TP = 719, FP = 457)
class_id = 2, name = bottle, ap = 91.58%   (TP = 913, FP = 233)
class_id = 3, name = car, ap = 85.28%      (TP = 4643, FP = 1518)
class_id = 4, name = person, ap = 94.63%   (TP = 943, FP = 162)
class_id = 5, name = chair, ap = 94.71%    (TP = 945, FP = 166)

for conf_thresh = 0.25, precision = 0.75, recall = 0.86, F1-score = 0.80
for conf_thresh = 0.25, TP = 8497, FP = 2904, FN = 1355, average IoU = 59.87 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.845090, or 84.51 %
Total Detection Time: 418 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 = 5069, unique_truth_count = 1995
class_id = 0, name = bird, ap = 10.72%      (TP = 35, FP = 45)
class_id = 1, name = book, ap = 0.32%      (TP = 3, FP = 102)
class_id = 2, name = bottle, ap = 13.38%   (TP = 45, FP = 75)
class_id = 3, name = car, ap = 5.34%       (TP = 149, FP = 461)
class_id = 4, name = chair, ap = 11.71%    (TP = 30, FP = 68)
class_id = 5, name = person, ap = 5.07%    (TP = 15, FP = 89)

for conf_thresh = 0.25, precision = 0.25, recall = 0.14, F1-score = 0.18
for conf_thresh = 0.25, TP = 277, FP = 840, FN = 1718, average IoU = 19.25 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.077600, or 7.76 %
Total Detection Time: 70 Seconds
```

## Pp-yolo for 1000 instances

```
DONE (t=0.97s)
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
```