

# Work report

23 Aug 2021

yolov4 for 1000 instances.

Epochs 28196

```
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.873319), count: 30, class_loss = 0.021321, iou_loss = 4.030734, total_loss = 4.082070)
total_bbox = 1024426, rewritten_bbox = 46.356205 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.853844), count: 18, class_loss = 0.010401, iou_loss = 41.317406, total_loss = 41.327808
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.821006), count: 56, class_loss = 2.678274, iou_loss = 34.135036, total_loss = 36.813313
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.843450), count: 22, class_loss = 1.853169, iou_loss = 2.404140, total_loss = 4.257309
total_bbox = 1024522, rewritten_bbox = 46.356544 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.517318), count: 49, class_loss = 5.899628, iou_loss = 429.193817, total_loss = 435.093445
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.795383), count: 14, class_loss = 1.047384, iou_loss = 10.220129, total_loss = 11.267512
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.787346), count: 6, class_loss = 0.157322, iou_loss = 1.121894, total_loss = 1.279215
total_bbox = 1024591, rewritten_bbox = 46.356743 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.877956), count: 37, class_loss = 0.459318, iou_loss = 141.513412, total_loss = 141.972733
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.893782), count: 59, class_loss = 0.972348, iou_loss = 45.382072, total_loss = 46.354420
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.879412), count: 32, class_loss = 0.753513, iou_loss = 3.788833, total_loss = 4.542346
total_bbox = 1024719, rewritten_bbox = 46.356709 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.888521), count: 38, class_loss = 0.930113, iou_loss = 76.363884, total_loss = 77.293999
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.893684), count: 89, class_loss = 0.745156, iou_loss = 61.309875, total_loss = 62.055031
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.880423), count: 40, class_loss = 0.716091, iou_loss = 7.568551, total_loss = 8.284642
total_bbox = 1024886, rewritten_bbox = 46.356277 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.834790), count: 12, class_loss = 0.172527, iou_loss = 80.449974, total_loss = 80.622498
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.893929), count: 13, class_loss = 1.749503, iou_loss = 8.403225, total_loss = 10.152727
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.894434), count: 21, class_loss = 0.613207, iou_loss = 1.879263, total_loss = 2.492470
total_bbox = 1024932, rewritten_bbox = 46.356247 %

(next mAP calculation at 28236 iterations)
Last accuracy mAP@0.50 = 7.60 %, best = 7.82 %
28196: 0.585335, 1.181851 avg loss, 0.000010 rate, 10.760893 seconds, 902272 images, 4.460375 hours left
Loaded: 0.000048 seconds
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.773633), count: 92, class_loss = 3.123216, iou_loss = 346.038086, total_loss = 349.161316
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.739699), count: 40, class_loss = 4.496327, iou_loss = 33.990829, total_loss = 38.487156
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.790925), count: 16, class_loss = 2.063998, iou_loss = 0.988135, total_loss = 3.052133
total_bbox = 1025080, rewritten_bbox = 46.357262 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.758507), count: 49, class_loss = 2.602029, iou_loss = 199.236816, total_loss = 201.838852
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.776213), count: 36, class_loss = 0.438083, iou_loss = 41.001240, total_loss = 41.439323
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.852257), count: 11, class_loss = 0.208419, iou_loss = 1.597239, total_loss = 1.805958
total_bbox = 1025176, rewritten_bbox = 46.357113 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.793559), count: 40, class_loss = 4.042142, iou_loss = 136.757080, total_loss = 140.799225
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.881405), count: 12, class_loss = 0.351185, iou_loss = 12.493320, total_loss = 12.844505
```

## 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 = 17700, unique\_truth\_count = 9852

class\_id = 0, name = bird, ap = 84.65% (TP = 355, FP = 118)

class\_id = 1, name = book, ap = 78.51% (TP = 788, FP = 206)

class\_id = 2, name = bottle, ap = 95.09% (TP = 947, FP = 85)

class\_id = 3, name = car, ap = 90.09% (TP = 4836, FP = 548)

class\_id = 4, name = person, ap = 98.32% (TP = 974, FP = 51)

class\_id = 5, name = chair, ap = 96.39% (TP = 956, FP = 49)

for conf\_thresh = 0.25, precision = 0.89, recall = 0.90, F1-score = 0.90

for conf\_thresh = 0.25, TP = 8856, FP = 1057, FN = 996, average IoU = 76.87 %

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

mean average precision (mAP@0.50) = 0.905065, or 90.51 %

Total Detection Time: 91 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 = 2248, unique_truth_count = 1995
class_id = 0, name = bird, ap = 12.38%      (TP = 31, FP = 25)
class_id = 1, name = book, ap = 0.11%      (TP = 2, FP = 73)
class_id = 2, name = bottle, ap = 12.62%   (TP = 37, FP = 54)
class_id = 3, name = car, ap = 4.93%       (TP = 131, FP = 302)
class_id = 4, name = chair, ap = 11.67%    (TP = 29, FP = 61)
class_id = 5, name = person, ap = 4.76%    (TP = 16, FP = 60)

for conf_thresh = 0.25, precision = 0.30, recall = 0.12, F1-score = 0.17
for conf_thresh = 0.25, TP = 246, FP = 575, FN = 1749, average IoU = 24.41 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.077448, or 7.74 %
Total Detection Time: 14 Seconds
```

## MAP(21.08.2021)

### 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 = 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
```

## Pp-yolo for 1000 instances

```
DONE (t=0.57s)
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
```