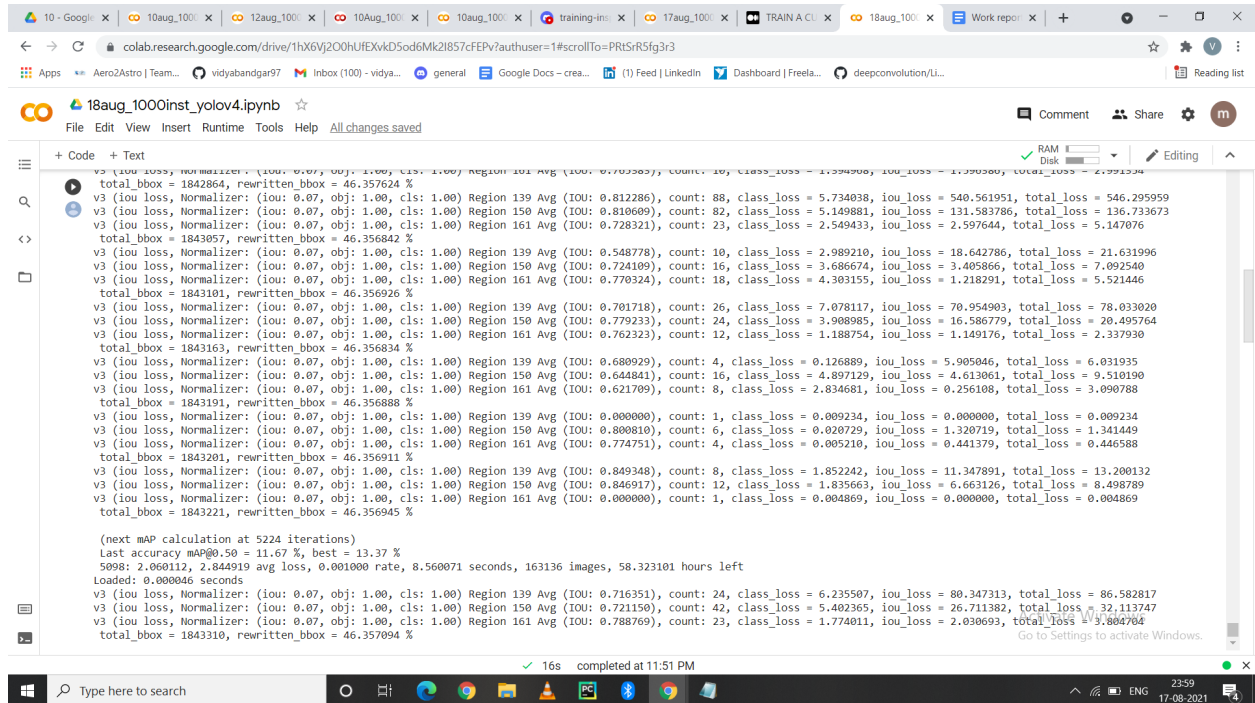


Work report

17 Aug 2021

yolov4 for 1000 instances.

Epochs 5098



```
18aug_1000inst_yolov4.ipynb
File Edit View Insert Runtime Tools Help All changes saved

+ Code + Text
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.812286), count: 88, class_loss = 5.734038, iou_loss = 540.561951, total_loss = 546.295959
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.810609), count: 82, class_loss = 5.149881, iou_loss = 131.583786, total_loss = 136.733673
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.728321), count: 23, class_loss = 2.549433, iou_loss = 2.597644, total_loss = 5.147076
total_bbox = 1843057, rewritten_bbox = 46.356842 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.548778), count: 10, class_loss = 2.989210, iou_loss = 18.642786, total_loss = 21.631996
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.724109), count: 16, class_loss = 3.686674, iou_loss = 3.405866, total_loss = 7.092540
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.770324), count: 18, class_loss = 4.303155, iou_loss = 1.218291, total_loss = 5.521446
total_bbox = 1843101, rewritten_bbox = 46.356926 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.701718), count: 26, class_loss = 7.078117, iou_loss = 70.954903, total_loss = 78.033020
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.779233), count: 24, class_loss = 3.908985, iou_loss = 16.586779, total_loss = 20.495764
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.762323), count: 12, class_loss = 1.188754, iou_loss = 1.149176, total_loss = 2.337930
total_bbox = 1843163, rewritten_bbox = 46.356834 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.680929), count: 4, class_loss = 0.126889, iou_loss = 5.905046, total_loss = 6.031935
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.644841), count: 16, class_loss = 4.897129, iou_loss = 4.613061, total_loss = 9.510190
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.621709), count: 8, class_loss = 2.834681, iou_loss = 0.256108, total_loss = 3.090788
total_bbox = 1843191, rewritten_bbox = 46.356888 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.000000), count: 1, class_loss = 0.009234, iou_loss = 0.000000, total_loss = 0.009234
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.800810), count: 6, class_loss = 0.020729, iou_loss = 1.320719, total_loss = 1.341449
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.774751), count: 4, class_loss = 0.005210, iou_loss = 0.441379, total_loss = 0.446588
total_bbox = 1843201, rewritten_bbox = 46.356911 %
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.849348), count: 8, class_loss = 1.852242, iou_loss = 11.347891, total_loss = 13.200132
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.846917), count: 12, class_loss = 1.835663, iou_loss = 6.663126, total_loss = 8.498789
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.000000), count: 1, class_loss = 0.004869, iou_loss = 0.000000, total_loss = 0.004869
total_bbox = 1843221, rewritten_bbox = 46.356945 %

(next mAP calculation at 5224 iterations)
Last accuracy mAP@0.50 = 11.67 %, best = 13.37 %
5098: 2.060112, 2.844919 avg loss, 0.001000 rate, 8.560071 seconds, 163136 images, 58.323101 hours left
Loaded: 0.000046 seconds
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 139 Avg (IOU: 0.716351), count: 24, class_loss = 6.235507, iou_loss = 80.347313, total_loss = 86.582817
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 150 Avg (IOU: 0.721150), count: 42, class_loss = 5.402365, iou_loss = 26.711382, total_loss = 32.113747
v3 (iou loss, Normalizer: (iou: 0.07, obj: 1.00, cls: 1.00) Region 161 Avg (IOU: 0.788769), count: 23, class_loss = 1.774011, iou_loss = 2.030693, total_loss = 3.804704
total_bbox = 1843310, rewritten_bbox = 46.357094 %

Go to Settings to activate Windows.

16s completed at 11:51 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 = 44090, unique_truth_count = 9852

class_id = 0, name = bird, ap = 68.94% (TP = 301, FP = 230)

class_id = 1, name = book, ap = 52.90% (TP = 604, FP = 567)

class_id = 2, name = bottle, ap = 84.46% (TP = 843, FP = 220)

class_id = 3, name = car, ap = 78.20% (TP = 4267, FP = 1641)

class_id = 4, name = person, ap = 90.73% (TP = 883, FP = 175)

class_id = 5, name = chair, ap = 90.19% (TP = 882, FP = 210)

for conf_thresh = 0.25, precision = 0.72, recall = 0.79, F1-score = 0.75

for conf_thresh = 0.25, TP = 7780, FP = 3043, FN = 2072, average IoU = 55.38 %

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

mean average precision (mAP@0.50) = 0.775704, or 77.57 %

Total Detection Time: 88 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 = 5489, unique_truth_count = 1995
class_id = 0, name = bird, ap = 17.75%      (TP = 41, FP = 29)
class_id = 1, name = book, ap = 1.05%      (TP = 6, FP = 105)
class_id = 2, name = bottle, ap = 15.43%   (TP = 44, FP = 65)
class_id = 3, name = car, ap = 7.35%       (TP = 167, FP = 405)
class_id = 4, name = chair, ap = 15.49%    (TP = 34, FP = 75)
class_id = 5, name = person, ap = 13.07%   (TP = 21, FP = 61)

for conf_thresh = 0.25, precision = 0.30, recall = 0.16, F1-score = 0.21
for conf_thresh = 0.25, TP = 313, FP = 740, FN = 1682, average IoU = 22.64 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.116886, or 11.69 %
Total Detection Time: 14 Seconds
```

Pp-yolo for 1000 instances

```
DONE (t=0.07s)
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
```
