

## mean Average Precision

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Apr 9 2018

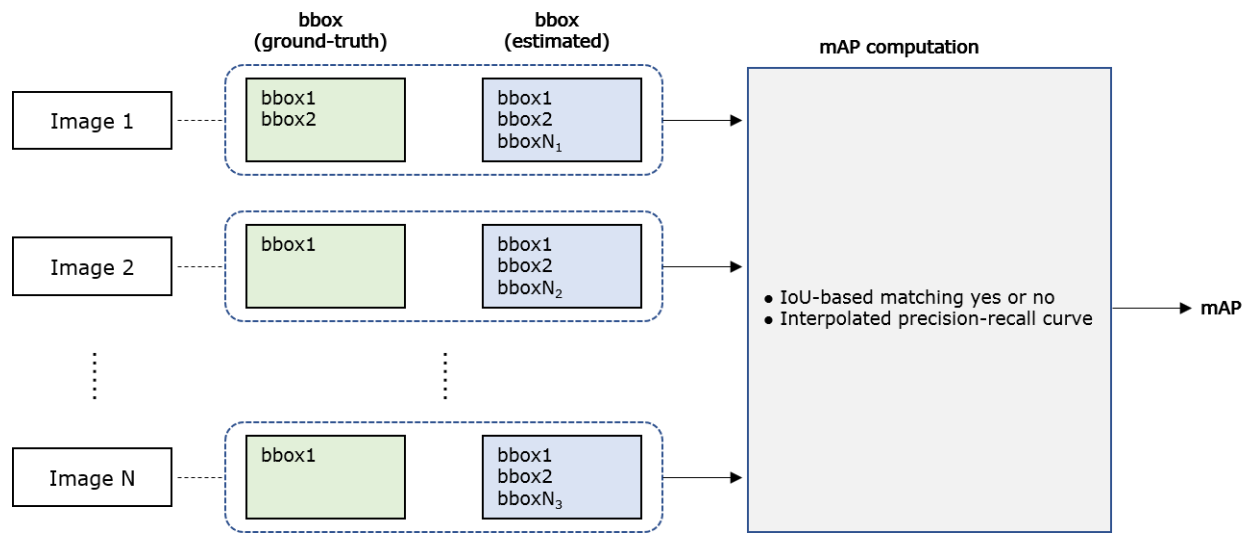
### □ Note that

- An object detector produces a bounding box with a confidence score that represents its confidence about being an object.
- IoU, object category should be considered.

### □ Procedure for computing mAP

- For all the testing images, gather all the bounding boxes (produced by an object detector with zero detection threshold for a confidence score), where each box has a confidence score. We will call the detection threshold *confidence threshold*.
- With ground-truth bounding boxes, choose true positive bounding boxes among the produced bounding boxes.
  - Q. How can we deal with bounding boxes overlapped with one certain ground-truth bounding box?
    - [4] says that "If multiple detections of the same object are detected, it counts the first one as positive while the rest as negatives."
    - Does it mean that the rest are just gone?
- Sort the produced bounding boxes according to the confidence score.
- Draw precision-recall curve, while varying the confidence threshold.
- Obtain the interpolated precision-recall curve, where the recall is [0.0, 1.0] with step 0.1.
  - Q. Why do we use the interpolated precision-recall curve?
    - In order to reduce wiggles in the curve.
- Compute average precision(AP) for one certain object category, by averaging the precisions at each 0.1 steps of recall, i.e., [0.0, 0.1, ..., 1.0].
- Compute mean AP from APs for all object category.

## □ Software module



## Reference

[1] mAP(Mean Average Precision) - Object Detection 성능 측정 지표

<http://blog.naver.com/PostView.nhn?blogId=sogangori&logNo=221224276320#>  
(Written in Korean)

[2] mAP (Mean Average Precision) 정리

<http://better-today.tistory.com/3>  
(Written in Korean)

[3] mAP (mean Average Precision) for Object Detection

[https://medium.com/@jonathan\\_hui/map-mean-average-precision-for-object-detection-45c121a31173](https://medium.com/@jonathan_hui/map-mean-average-precision-for-object-detection-45c121a31173)

[4] P. Henderson, et al., "End-to-end training of object class detectors for mean average precision

[5] M. Everingham, et al., "The PASCAL Visual Object Classes (VOC) Challenge", IJCV 2010

[6]

<https://medium.com/@timothycarlen/understanding-the-map-evaluation-metric-for-object-detection-a07fe6962cf3>

## Code

□ mAP (mean Average Precision)

<https://github.com/Cartucho/mAP>

□ Code linked in [2]

[https://github.com/penny4860/object-detector/blob/master/object\\_detector/evaluate.py](https://github.com/penny4860/object-detector/blob/master/object_detector/evaluate.py)

□ Code linked in [6]

<https://gist.github.com/tarlen5/008809c3decf19313de216b9208f3734>