**mean Average Precision**

Jungwon Kang

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 boxes?

🡪 [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**

A screenshot of a cell phone

Description generated with very high confidence

**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

[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

□ Code linked in [6]

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