DA 312

Lab Assignment 6
Topic: Object Detection

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1. You have developed a cat detection algorithm using an image-based object detection technique. Your friend, who is also a computer vision researcher and a cat enthusiast, provided you with an image to test your detector. The image contains several cats, and your task is to evaluate the performance of your detector using the provided ground truth bounding boxes and the bounding boxes predicted by your detector.

Given Data:
Ground Truth Bounding Boxes (representing [xmin, ymin, width, height]):

[133, 374, 110, 53]
[158, 26, 150, 124]
[9, 493, 131, 77]
[397, 63, 106, 57]
[304, 470, 171, 60]
[256, 176, 139, 169]

Predicted Bounding Boxes (representing [xmin, ymin, width, height, score]):

[140, 370, 119, 54, 0.95]
[368, 428, 187, 193, 0.94]
[146, 11, 152, 119, 0.92]
[310, 482, 161, 67, 0.91]
[23, 506, 133, 68, 0.88]
[19, 499, 130, 60, 0.85]
[416, 381, 133, 97, 0.85]
[387, 68, 107, 48, 0.83]
[20, 500, 125, 60, 0.82]

(a) Apply NMS (non maximum suppression) to the output of the detector.
(b) Using 11-point interpolation, calculate AP@0.2, AP@0.5, and AP@0.8.

2. Perform object detection using FasterRCNN using inbuilt models available in PyTorch or Tensorflow. For example, you can use fasterrcnn_resnet50_fpn in PyTorch.

(a) Show the resultant bounding boxes (for score>0.8) for this sample image.
(b) Now, set the score threshold to 0.2. You will see many bounding boxes appearing multiple times for the same object and therefore require cleaning. Apply NMS and show the final results.