

YOLOv5++ for multiple Object Detection from cluttered indoor shots, invariant to sensor, lighting and affine transformation

Computer Vision (CS6350)

TPA-3

1. Problem Statement

Localization of different types of objects in indoor scenes with the help of bounding-boxes using Deep Learning techniques. The images may include challenges like occlusion, background clutter, camera shake, varied object size, affine transformation and illumination condition. The aim of the project is to detect and recognize objects in real-time, taking live feed from a web-camera (for live demo). Models based on recent state-of-the-art methods like YOLO v5[1], YOLO v3[7], RefineNet [8], Relation-Net [9], RFBNet [10], CornerNet [11] etc. or anything new showing substantial performance over the existing techniques are expected.

2. Input

Images containing objects.

3. Assumptions

Images may contain multiple objects of the same or different classes.

4. Output

- Detect, identify and visualize the location of each of the objects in the input image using bounding boxes
- Obtain the class label of the detected objects.
- Calculate Rank-1 recognition rate of each of the objects detected.
- Online demo taking live feed from web-camera.

- Off-line performance on a set of test images (to be provided during evaluation) using mean Average Precision ($mAP@IoU=0.5$) as evaluation metric

5. Object recognition example



6. Datasets

- [ImageNet](#), [MS COCO](#) and [Pascal VOC](#) (2011) to be used for training followed by fine-tuning in *VPLab-Indoor Dataset* (to be provided).

7. References

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