

Task 1

This task involves training an object detection model to detect the largest and the smallest object from an image. For instance, in the given image, the person is the largest object and the ball is the smallest object.

The task is divided into several steps, as outlined below:

Start by downloading the necessary data from the following urls: [images](#) & [annotations](#).

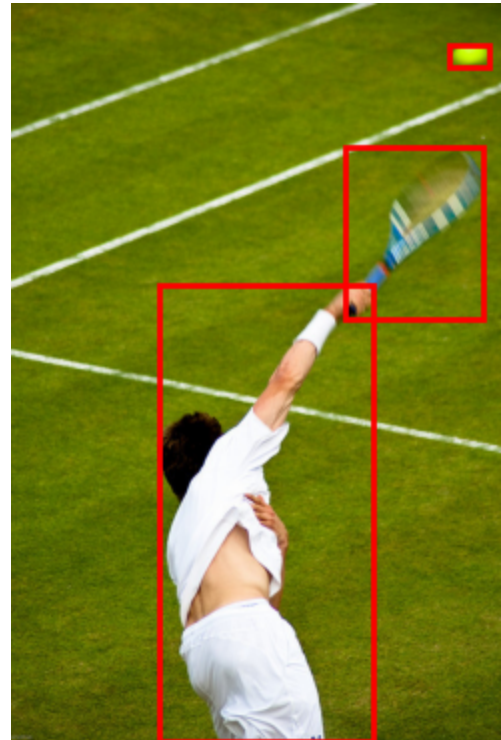
Unzip the downloaded folders, and you will find the instances_val2017.json file. This JSON file contains annotations, including bounding boxes and labels for all of the images.

Clean the dataset to fit the task requirements. Split it into training (90%) and validation (10%) subsets.

For training, use the YOLOv7 object detection model. Here is the pretrained model [yolov7.pt](#). Change your model architecture to detect only two classes per image (largest and smallest) instead of the 80 classes from the given dataset. Train the model for 20 epochs. For enhanced tracking of training progress and metrics, integrate the Weights & Biases (W&B) platform.

Use the trained model for inference. Your model should predict only two objects per image, the largest and the smallest one.

Write a summary of your findings. Justify your design choice and if anything did not work, explain why. Include the W&B link in your report. Share your **reproducible** code through Github.



Task 2

In YOLOv7 object detection training, several image transformations (e.g., resizing and flipping) are applied before converting an image into a tensor. Here's the typical transformation flow:

Image -> Transformation 1 -> Transformed Image 1 -> Transformation 2 -> Transformed Image 2 -> Tensor

Your task is to input an image into the YOLOv7 model and identify all the transformed images generated during training, such as `transformed_image_1` and `transformed_image_2`.

Provide the code used to extract the transformed images and share the images themselves through Github. Explain how to run the code for a different image.

If you have any questions or inquiries, please send an email to maruf@amagroup.io.