Assignment 3 – Data Collection for the Use of Object Detection Using Yolo V8
Summer, 2023

Image format

Each mobile phone will have its own image format. Yolo V8 only read one format. Hence, you need to bear in mind as which formats your team will have and keep track of it. Also lighting condition has significant impacts on the images. Hence, you make need to make sure you use the similar setting of the cameras of the phones that your group has.

Image Annotation - Bounding Boxes

Bounding boxes are determined by the x and y axis coordinates in the upper-left corner and the x and y axis coordinates in the lower-right corner of the rectangle. Bounding boxes are used to localize the position of an object (Fig 1).
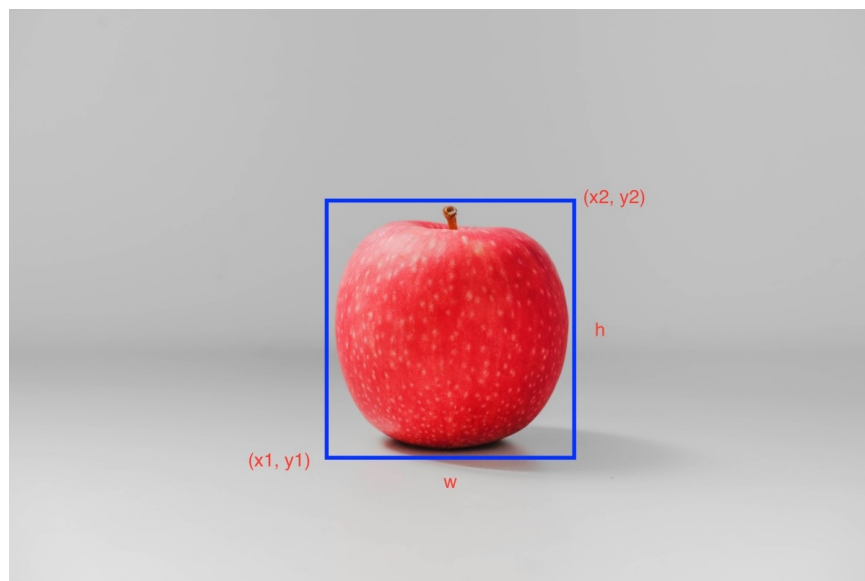

Figure 1: Bounding box of Apple

The tool to label an image can be: LabelImg or LabelMe.

Factors affect Yolo V8 performance:

One of the main factors affecting the performance of Yolo is dataset quality and diversity, including a wide range of **object classes**, **variations in scale**, **pose, lighting condition**s, and occlusions.

Your team has a task of collecting images of **8 items** that have different **shapes/as angles and backgrounds**. Each item can have various shapes and colours, for example bottle of wines can be brown, or white or yellow. Shapes here meaning the shapes of bottles would be different. Figure 1 shows an example of different shapes and colours.

Figure 1: Shapes and colours of wine bottles

Each item should have **at least 120 distinct images** with different **scales, poses, lighting conditions, and crowded and dynamic background, and luminosity.**

Also you will need label the images as well. The annotation for images are attached in the spreadsheet.

Requirement to submit:

- A 1 zip files containing images + labels, including:
  - Zip file (1): containing original images + Set of labels 1; The labels are used a combination of sub-category numbers (in the excel file) + name of items.
- A report provide details of (1) description of how images were collected. You can explore existing images (secondary sources) as well as collecting image using your own devices (primary sources), and (2) **challenge in data collections** (i.e. different bread holder including paper materials and plastic materials);
- Spread sheet to summarize images formats (such as how many in jpeg, or HECI, etc), resolution, and type of phones that you used to take pics;
- A set of labels.

Materials for your references:
- Yolo V8: https://www.youtube.com/watch?v=hg4oVgNq7Do&t=16s
- LabelIMG: https://github.com/heartexlabs/labelImg

Mark allocation

At least 120 images and labels per object	5 points x 8 = 40

Report describing the process of data collections and challenges in collecting data and description of meta data	10
Total	**50**