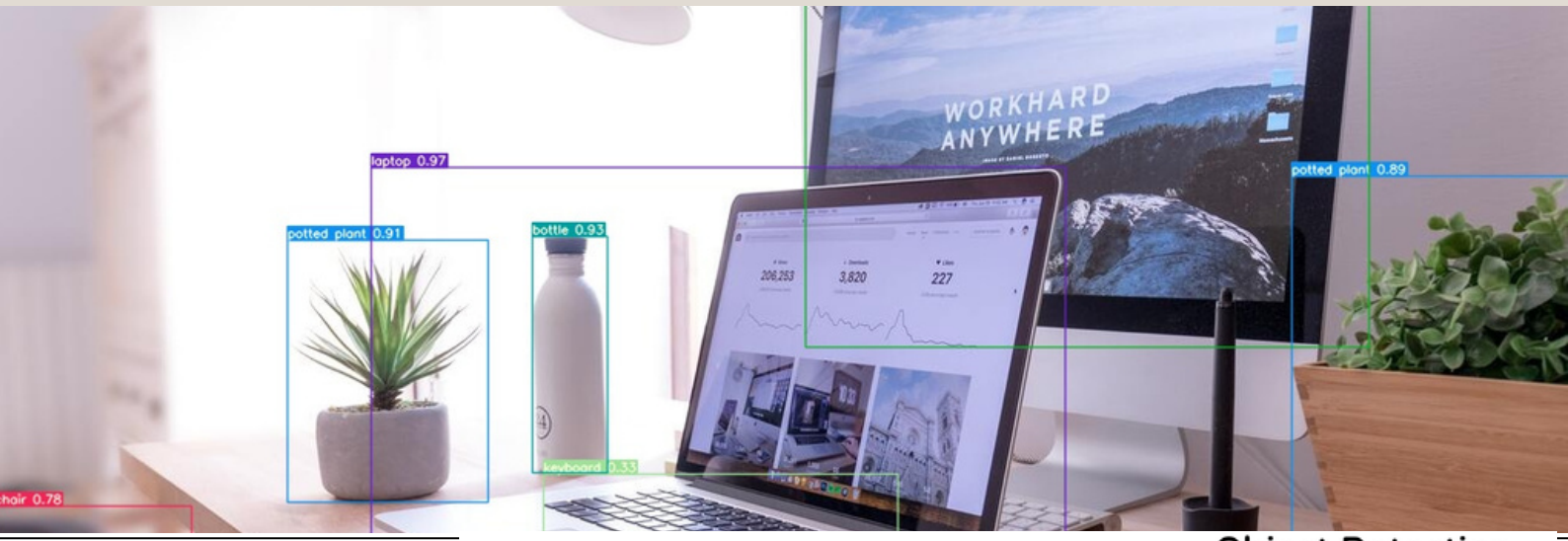
Fastest Real Time Object Detection

10TH OCT 2022 | @YOLOV7 | SPEED



Abbreviations:

- *Object classification: differentiating an object in an image*
- *Object localization: identifying the location of the, and then drawing a bounding box around it.*
- *Object detection: the combination of object classification and localization.*
- *CNN: convolutional neural network*
- *YOLO: you only look once. A new object detection approach, which uses features learned by a deep convolutional network to detect objects in an image.*
- *SSD: single shout multibox detector*
- *IOU : intersection over Union*
- *PR curve: Precision- recall curve*
- *mAP: mean average precision*
- *mAR: mean average recall*
- *FPS: frame per second*
- *COCO dataset: Common Objects in Context*
- *OpenCV: open computer vision. An open-source library of functions that allow for real-time computer vision*

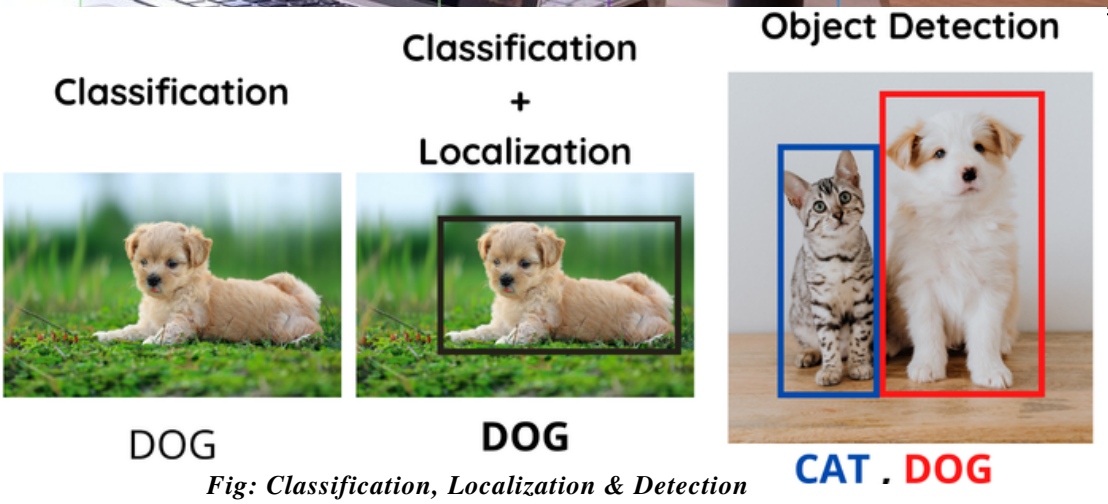
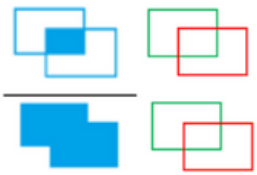


Fig: Classification, Localization & Detection

$$IOU = \frac{Area\ of\ Overlap\ (B_{gt} \cap B_p)}{Area\ of\ Union\ (B_{gt} \cup B_p)} =$$



Applications:

Bounding Box

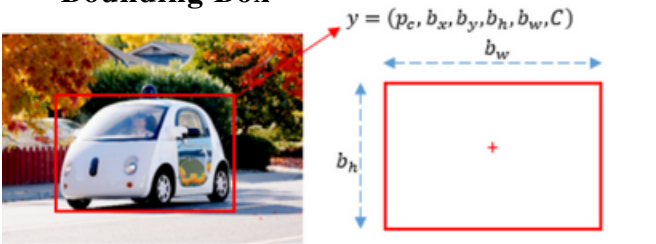
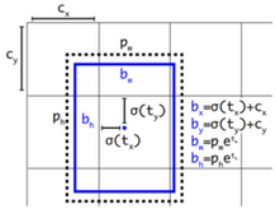


Fig: An example of a bounding box with its output elements

- *pc : confidence of an object being present in the bounding box*
- *bx : the offset of the x coordinate of the predicted bounding box' s center*
- *by : the offset of the y coordinate of the predicted bounding box' s center*
- *bh : the offset of the bounding box' s heigh that contains an object*
- *bw : the offset of the bounding box' s width that contains an object*
- *C : class of the object being detected (e.g 1.person,2.bick,3.car…)*



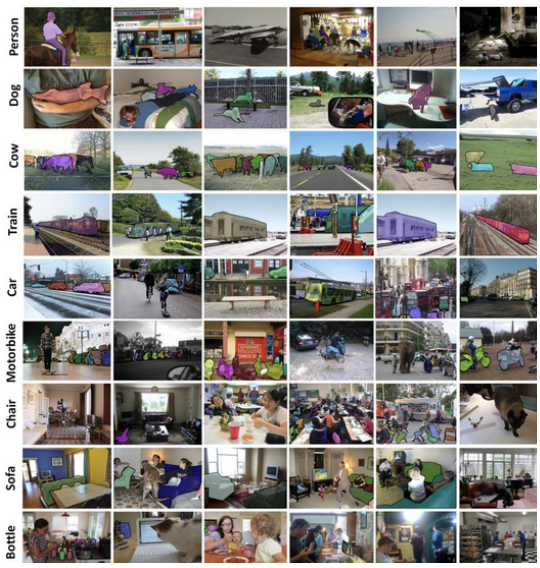


Fig: COCO Dataset