Object detection

 Computer Vision is also composed of various aspects such as image recognition, object detection, image generation, image super-resolution and more. Object detection is probably the most profound aspect of computer vision due the number practical use cases

Object detection refers to the capability of computer and software systems to locate objects in an image/scene and identify each object. Object detection has been widely used for face detection, vehicle detection, pedestrian counting, web images, security systems and driverless cars. There are many ways object detection can be used as well in many fields of practice.

There are existence modern and highly accurate object detection algorithms and methods such as R-CNN, Fast-RCNN, Faster-RCNN, RetinaNet and fast yet highly accurate ones like SSD and YOLO. Using these methods and algorithms, based on deep learning which is also based on machine learning require lots of mathematical and deep learning frameworks understanding.

We can distinguish between these three computer vision tasks:

* **Image Classification**: Predict the type or class of an object in an image.
  + *Input*: An image with a single object, such as a photograph.
  + *Output*: A class label (e.g. one or more integers that are mapped to class labels).
* **Object Localization**: Locate the presence of objects in an image and indicate their location with a bounding box.
  + *Input*: An image with one or more objects, such as a photograph.
  + *Output*: One or more bounding boxes (e.g. defined by a point, width, and height).
* **Object Detection**: Locate the presence of objects with a bounding box and types or classes of the located objects in an image.
  + *Input*: An image with one or more objects, such as a photograph.
  + *Output*: One or more bounding boxes (e.g. defined by a point, width, and height), and a class label for each bounding box

Classification confidence threshold:

Minimum confidence score of detected labels. If not set, any classifier threshold specified by the model’s metadata will be used. If the model does not contain any metadata or the metadata does not specify a classifier threshold, a default threshold of 0.0 will be used.

Object detection is a computer vision technique in which a software system can detect, locate, and trace the object from a given image or video. The special attribute about object detection is that it identifies the class of object (person, table, chair, etc.) and their location-specific coordinates in the given image. The location is pointed out by drawing a bounding box around the object. The bounding box may or may not accurately locate the position of the object. The ability to locate the object inside an image defines the performance of the algorithm used for detection. Face detection is one of the examples of object detection.

MobilenetSSD is an object detection model that computes the bounding box and category of an object from an input image. This Single Shot Detector (SSD) object detection model uses Mobilenet as backbone and can achieve fast object detection optimized for mobile devices.