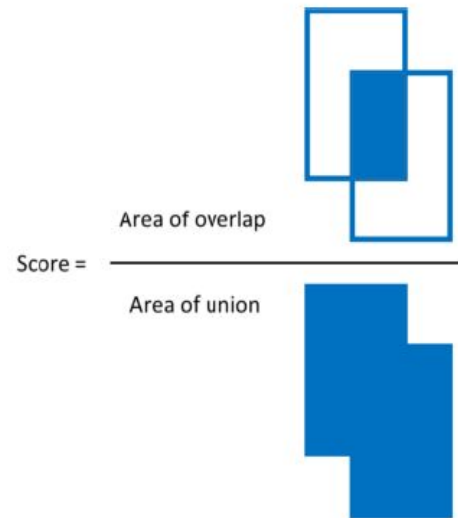


Terminology

- BBox - bounding box: A bounding box is an imaginary rectangle that serves as a point of reference for object detection and creates a collision box for that object.
- GT - Ground truth:
Ground truth is information that is known to be real or true, provided by direct observation and measurement (i.e. empirical evidence) as opposed to information provided by inference.
- Detections - the output of the system.
- IoU - Intersection over Union (IoU) - measures similarity between finite sample sets. comes to help us determine the precision or truth of the object detected.



Bounding Boxes and positioning precision

But how does object detection work in relation to bounding boxes? Answering this question requires looking at object detection as two components: object classification and object localization. In other words, to detect an object in an image, the computer needs to know what it is and where it is.

In the attached video shown an example the model detection outputs. As we can see, the anotannotator is drawing bounding boxes around vehicles, signs and people on the frame and label them by Object class (color for each kind of object) together with quantitative info indicates the confidence level of the system. IoU in this assignment

This helps train an algorithm to understand what vehicles look like. Annotating objects such as vehicles, traffic signals, and pedestrians makes it possible for autonomous vehicles to maneuver busy streets safely.

At the next 2 slide we will see few examples that I choose to focus while analysing the systems' performance in the clip

Strengths and Weaknesses

1. As we can see in minute 00:21, the model could not detect properly the Tractor - the prediction rate or IoU in this case is not high enough to classified the object. The reason can be related to the mount of data collected on this type of vehicle so far. The number of bounding boxes appears on the frame at the video can confirm this assumption. Although in most cases seems that the system object class high scores while labeling in different colors each type of object: people in red, cars in yellow etc.



Strengths and Weaknesses 2

2. In the next example It's seems the system classify the object detection as True Positive only approximately 2 seconds after it classified the object as a vehicle and draw a yellow b.box around it.



Strengths and Weaknesses 3

3. Substantial strength of the system is the ability to detect quiet fast a car showing up from the side into intersection (compare to other frames which car appears either front or back side).



Conclusions and Points for R&D

1. Time is critical in environment like the road, as a cases and should be considering ways to cut it.

Finding a ways to get higher rate of detected bounding boxes per unit of time.

As we can reach shorter interval of time between two b.box over sequence of frames, as faster the model can detect an object and classified it, leaves more time for ADAS to react to hazards on the road.

2. As car speed increases the power consumed to by the system increases accordingly, might be a way to control system runtime due to the current driver's car speed..