

AFRICAN MASTERS IN MACHINE INTELLIGENCE

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BUILDING AN OBJECT TRACKER.

1. Introduction

In this practical session, we prepared a video dataset and training the predictions from Detectron2 models.[1] We used videoclip frames dataset to build a simple object tracker. The tracker will detect objects on all frames of a video and link predictions from one frame to the next frame.

2. Detecting Objects in Frames

In this part we detected the objects in the frame with their corresponding label and accuracy. We looped for all images and visualize the predictions from a random set of frames in order to be able to run and store the predictions for all frames in the video clip. The figure 1 shows saved prediction of a frame with it's label.



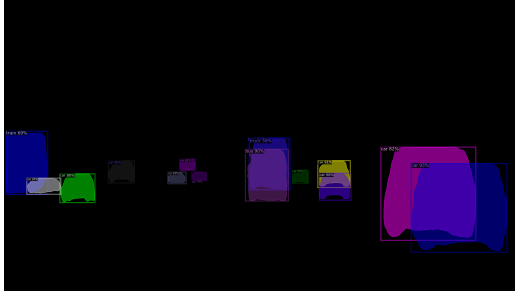
Figure 1: draw the predictions on the frame

As shown in the above figure, the model managed to store prediction well for all objects with bounding box contain random color.

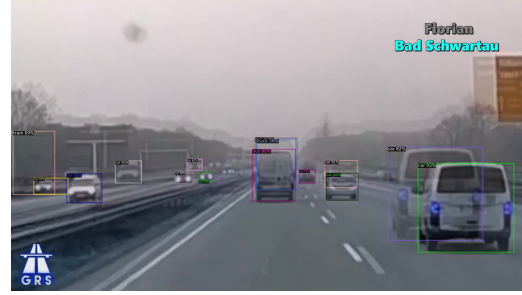
3. Tracking Objects in Pairs of Frames

In this part we were able to track and detect objects in 2 frames. The task required that we tracks the objects in two consecutive frames. we created a function that relies on the intersection of bounding boxes of objects between one frame and another. For a successful tracking, we saw that there was a strong overlapping between two frames and the same class prediction. We tracked without caring on the color (colors provided randomly). The pairs tracked frames, one pair is from the start, another pair in the middle and lastly from the end of the video. Below is one sample of tracked pairs of frames.

All the two figures shows different overlap held after doing prediction. In the figure 2, there were three overlap: Track and Buss and two cars.



(a) Mask of two predictions.

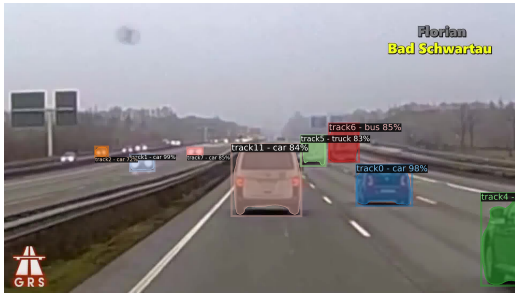


(b) Draw boxes on two predictions.

Figure 2: Drawing of prediction1 and prediction2.

4. Part C: Tracking Objects in Videos

In this part we will be able to track more than two frames. As the goal of this lab is to locate a moving object in a sequence of frame, we want to give identification of each object whereby each track ID have it's own color and same objects have both same color and ID. The above statement will help as to visualise different overlap happened.



(a) Frame 1.



(b) Frame 2.

Figure 3: Track object in videos

As conclusion, we managed to track all objects with it's identity using color code. We visualized that if the car is moving faster there is a probability that a model can provides two different identifiers for predicting one car as two which is a mistake.

References

- [1] <https://github.com/gkioxari/aims2020-visualrecognition/releases/download/v1.0/videoclip.zip>
- [2] <https://github.com/gkioxari/aims2020-visualrecognition/blob/master/LAB3.md>