

Weekly Report 6

Group 6 Project 1

Using Slicing Techniques for Detecting Small Objects

We explored slicing using SAHI (Slicing aided Hyper Inference). What slicing does is it break the images into frames that, are treated as the whole images (like now the model would use this slice of the image and try to find the objects in it).

Introducing SAHI slicing as a helper for YOLOv5, a popular tool for spotting objects in pictures, has been quite the game-changer. It's like we've found a new way to make YOLOv5 even smarter at recognizing things in photos, which is exciting. This process is a bit like giving YOLOv5 a magnifying glass to see better, and it's been showing some promising signs of getting better at its job.

This is the test image on yolov5 before training.



And the below is the same test image after applying slicing using SAHI.



(The image is taken from the Vis drone dataset only)

We've been playing around with this approach using images from the Vis Drone dataset. This is becoming a tricky as many of its images aren't super clear, these blurred images make worsens the predictions while using the model with SAHI, as it increases the false positives. Even with SAHI slicing's help, YOLOv5 sometimes gets a bit confused by these blurry pictures. It might think it sees something that isn't there, like mistaking a tree for a person, because the details aren't clear.

One other reason for this could be that the images in the Vis drone dataset are not of the same dimensions. There are some images that are of high dimensions, and some are of very low dimensions, SAHI does seem to work well with the low dimensional images as now when it will break the images in frames, the resolution of the frame will even decrease, increasing the blurring effect which sort of increase the false positives as well.

For now, we are using singles images and test how they are performing manually, we tried training the model and feeding more images in test. But the model didn't perform as well as we put very less images for training and use a low epoch due to computational constraints. We will now extent this my using more training data and would try to improve the model. Also, we are working on using SAHI effectively to make accuracy even better after training.

References:

SAHI official github: <https://github.com/obss/sahi>