

Assignment3

1. Examine the performance of each approach separately



As you can see in the above 4 pictures, the first one is the motion detection based on temporal differentiation and the rest of pictures are based on adaptive background differentiation. The threshold of last three pictures respectively 0,0.5,1.

The cars, bikes and pedestrians are detected by sizes and speed. The speed of objects are the effects related to the size and contrast of objects against the background. Almost all the vehicles are detected and some bikes can be detected. Almost none of pedestrians are detected because of the low speed. When threshold is 0, there are many shadows in the image. After comparing the last three pictures, we can see that the smaller the threshold, the more items that can be detected with low movement speed, but there will be errors. The larger the threshold, the fewer detection errors and fewer detected objects.

2. Compare the performance of temporal differentiation versus background differentiation.

Background differentiation can change the performance of the detection by adjusting the threshold but the temporal differentiation can not. The advantage of temporal differentiation is that it can detect all different places between two images. I will use the

temporal differentiation method indoors because the objects in the room are small and slow. I will use the background differentiation method outdoors, because I can adjust the threshold to achieve the purpose of detecting different objects. Temporal differentiation can detect whether there is a thief in the room. Background differentiation can detect pedestrians at traffic lights.

3.



If the initial background model contains objects, the background differentiation method will cause false detections. So The first background image should select an image without objects. I think subtract the moving object of the second frame from the first image as a background image.(I don't know why it's not a grayscale image)