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# Assignment5 Report:

## Background Subtraction

CSE 691: Image and video processing

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## A. Background Subtraction(75%)

*Implement the background subtraction algorithm described by K. Kim, T. H. Chalidabhongse, D. Harwood and L. Davis in the paper titled "Background modeling and subtraction by codebook construction". Test your code on the video sequence provided.*

*You should:*

*a) [35%] construct the codebooks from N frames,*

Due to the slow performance of Python, I choose to construction the codebooks with 100 frames.

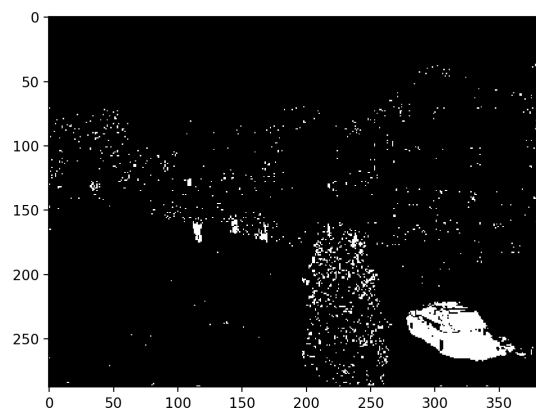
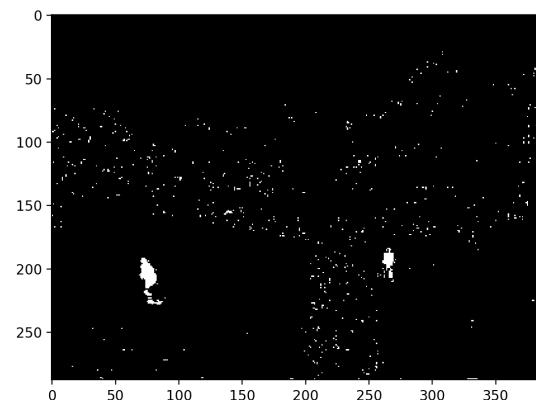
*b) [15%] refine the codebooks by employing the maximum negative run-length,*

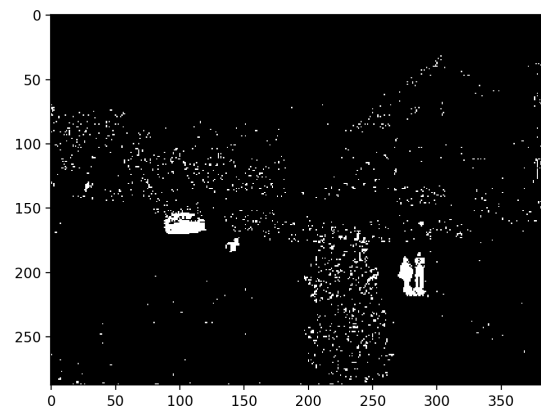
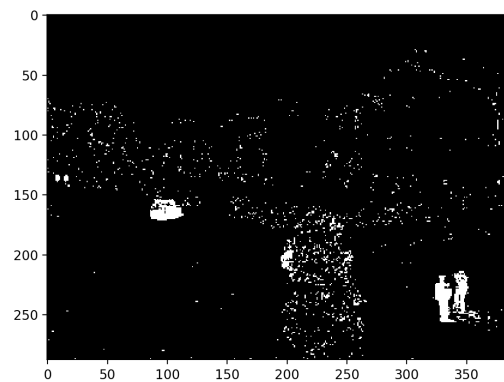
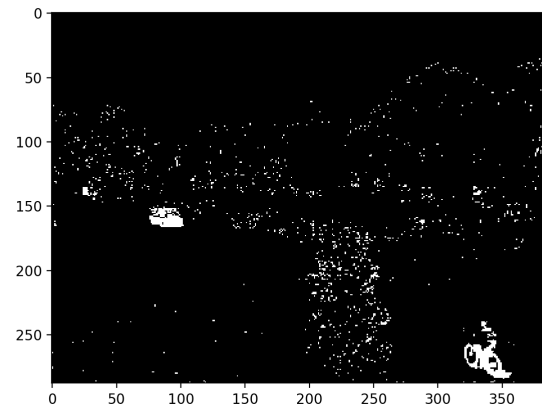
*c) [15%] apply foreground detection to get the foreground pixels,*

For part abc, please refer to the codes.

*d) [10%] save and show 5 example frames where there are multiple detected foreground objects.*

For the detection, I choose image 700, 939, 1522, 1675, 1815. They all have multiple objects in scene. My alpha and beta are set to 0.7 and 1.2 respectively. And threshold1 and threshold2 are set to 300.





## B. Morphological Operations (25%)

- Apply morphological operations to remove noisy foreground pixels, and to fill possible holes.*
- State which operations you chose and why you chose them.*

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First, apply the opening operation to the image. By opening, we can remove the noise in the picture. Then, apply the closing. By closing, we can closing the holes and gaps inside the objects.

*c) For the same 5 frames you used above, show the output of the morphological operations.*

