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CPE/EE 428

Homework 0: Background Subtraction

Part I.

2. The sizes of the dimensions are: (240, 320, 3). According to the OpenCV documentation, the first one is the image height, the second one is the image width, and the third one is the number of channels in the image. This means the image has a height of 240, width of 320, and has color.

3. When I print the image itself, I get an array that contains BGR information about each pixel in the image. This means the first of the 3 arrays contains information about the blue channel, the second one contains information about the green channel, and the third one contains information about the red channel.

Part II.

4. The cars seem like they disappeared, because the cars moved positions over each frame. When we turn the image into a grayscale, the values in the array represent the intensity of each pixel. As the movie plays on (as we move through each frame), we can see that some cars appear in one frame and disappear in the next few frames. At a specific location in the frame, the pixel intensities will be high when a car is present. At that same location, in the next few frames, the pixel intensities will lower since the car has moved. If we average the intensity levels over each frame as the pixel intensity levels change, we will seemingly “remove” the moving cars from the road.

Part III.

5. Both methods work well in applying a threshold. I noticed that using Otsu’s method gave me a quicker and easier time to apply the threshold. The first method worked as expected; using a binary mask, I had to play around with the threshold value and adjust it to work well. For the second method (Otsu’s method), the threshold value input could be chosen arbitrarily, so I could leave it up to Otsu’s method by using cv.THRESH\_OTSU as an extra flag. Each technique seemed to work almost the same, but the ability to tune the threshold value using a binary mask was helpful in catching more details in the foreground pixels. I think the output for Otsu’s method could be improved in the sense that it did not catch the shapes as well as the binary mask. The output can only be improved using the binary mask, by tuning the threshold value.