

DMET 1002 – Advanced Media Lab
Mini Project 1

Edge Detection and Motion tracking

Project Description:

One of the applications of edge detection is analyzing the data out of a video into different objects by determining the edges surrounding them. This helps you to identify the different features of the frames in a video.

Segmentation and clustering can also be used in order to track the motion of an object along the frames of a video.

In this project, you are asked to implement two different tasks on two different videos to thoroughly understand the above mentioned concepts. Please read the description and the steps of every task below.

Task 1

You need to implement an edge detection function. It will be then used on the frames of a video. Follow the steps in order to understand the task thoroughly:

- 1- Read the video “task1.mp4” and extract the different video frames into images.
- 2- Convert the video frames from RGB to Gray scale (for simplification), you are allowed to use it as an RGB video if you want. You can use the `rgb2gray` function.
- 3- Implement an edge detection function (Your OWN function, you are not allowed to use any predefined functions.)
- 4- Apply the edge detection function on the successive frames of the video.
- 5- Play the edge detected frames as a new video.

Task 2

Read the following steps in order to perform and thoroughly understand the task:

1. Read the video “task2.mp4” and extract the different video frames into images.
2. Convert the video frames from RGB to Gray scale. You can use the `rgb2gray` function.

3. Apply frame differencing on the successive video frames using your “own” written function (You are not allowed to use the predefined function of differencing).
4. Apply segmentation to the difference images you obtained in the previous step in order to differentiate between the moving object and the background (use your own function).
5. Find the mean position of all pixels having the same label identified in the previous segmentation step in order to detect the center point of the object to be detected and draw an arrow connecting the centers of the object across every two successive frames along the track of the object. Overlay those arrows on the first frame in the video.

Submission Details:

The deadline for the submission is 20/2/2019 for Wednesday Lab and 24/2/2019 for Sunday Lab.

Your code is to be submitted along the output image of the motion tracking.

Your project should be sent as an attachment to this email:

DMET1002AdvancedMediaLab@gmail.com

Good Luck ☺