Assignment 6. Video Analysis

18-798 IVM

Due: Oct. 17, Thursday, 3:00 pm

1. (25%) Write a proposal about your term project, including your name, title, data source, method, expected results and references.

2. (25%) Based on the store video, plot the Motion Energy Image.

3. (25%) Based on the store video, plot the Motion History Image and discuss the differences between MEI and MHI.

4. (25%) Based on the store video, plot the heat map of the human movements. Discuss the results.

Bonus Points:

5. (25%) Write an algorithm that tracks a moving hand without manual initiation of the target. Hint: you have to detect the hand skin color first.

6. (25%) Use the Mean-Shift method to track a moving hand in a video. You may manually enter the bounding box to initiate the tracking target.

7. (25%) Polar Coordinate Profile is effective in representing contour shapes. However, for some values of angle θ there may exist a number of different values of the radial distance r. Write an algorithm to solve the problem and test it on ten images of subjects including humans, cars, and dogs. Discuss the advantages and disadvantages of the method.

8. (25%) Use Radial Basis Function to recognize sign language for the letters A, B, and C.

9. (25%) Develop a demo for tracking faces in MATLAB.

10. (25%) Integrate face tracking and color amplification method to measure the facial pulse patterns in the video. Compare the results between with-tracking and without tracking. Read Chapter 7 for more details.