Question 1

Normal optical flow

1. Create a 101x101 image with a black (0) background and a white (255) box of size 21x21, placing the upper-left corner at pixel (row=40, col=6). Create another new box image, but shift the box 1-pixel to the right and 1-pixel down. Compute the normal flow between the images. Draw the flow direction on the four corners, and randomly sample 10 points on the four edges and draw the flows. Is the result what you expected? Why or why not? Comment on the flow for the 4 sides of the box and also the 4 corners.

2. **Submission**: 1. Submit your code. 2. Write a report (pdf file), which includes the result image and your comments.

Question 2

Motion History Image

1. Implement motion history image algorithm.

2. **Testing videos**: You should use three different clips to test your implementation. Download videos from http://www.umiacs.umd.edu/~zhuolin/PrototypeTree/Keck_Dataset.zip . Use the first 3 second clip of person1_gesture7_com.avi, first 2 seconds of person2_gesture5_com.avi and the first 4 seconds of person4_gesture7_com.avi to calculate MHIs.

3. **Hint**: You can calculate pixel-wise difference between two consecutive grayscale images in videos and set a threshold to detect motion pixels.

4. **Submission**: 1. Submit your code 2. Submit a report (pdf file) which includes the three motion history images.