**Computer Vision - 217**

**Homework 3**

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**Answers for questions:**

**Part A: Computing OF using Lucas-Kanade**

Question 5:

I ran the function OF in several scenarios:

1. Several pairs from the video Slide.avi
2. W - Changing the window size of the region
3. K - The distance between frames
4. Sigma - ?????

When using bigger window size each pixel has more influence on its neighbors, i.e. the algorithm can mark a pixel moving in an opposite direction or has a smaller magnitude because of it neighbors, the assumptions when using larger window won't be valid during developing the formulas out of taylor series. When increasing K (the distance between frames) and there is a fast motion we will miss those motion therefore for scenarios we want to segment background there is a chance we will mark moving objects as background.

Question 8:

1. We chose to scale the image from 0.3 to 0.7 and got the following results:
   1. **……NEED TO RUN THE FUNCTION AND ADD OBSERVATION**
2. If we use larger scale then we have better accuracy in all pixels and if we use smaller scale then we will receive the optical flow of large motion

The right order to compute optical flow is to start from small scales (large optical flow) to large scales (small optical flow)

Changing scale loose sometimes crucial information and might miss motions.

**Part B:**

* No question in this part

**Part C:**

Question 14:

The change detection algorithm is more sensitive to noise we can see it in SLIDE.AVI at the regions where the shade is located…….????.......

Part D:

Question 16:

1. The motion is not small
2. Brightness constancy is not satisfied
3. A point does not move like its meightbors:
   1. Window size is too large
   2. What is the ideal window size

Question 17:

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Question 18:

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Question 19:

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**Documentation of the function**

**Part A:**

* Stereo:
  + Function sign:

*[U,V]=OF(F1,F2,* Sigma\_S*, Region)*

* + Input parameters:
    - **F1,F2:** two frames from a sequence.
    - ***Region*** is the local neighborhood window for computing the matrix *A*.
    - **Sigma\_S** = spatial Gaussian smoothing parameter
  + Output parameters:
    - Matrix U and V the represent the optical flow for each pixel
  + The function is located in the file OF.m

**Part B:**

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