ENPM 673, Robotics Perception

Homework: Optical Flow Estimation

Due on: Thursday May 3, 2018

For this project, you will compute and compare optical flow on some sequences of the Middlebury Optical Flow dataset. You are to implement the Lucas-Kanade optical flow algorithm. The details are on the [Wikipedia](https://www.wikiwand.com/en/Lucas%E2%80%93Kanade_method) page.

**[Part 1] 30 pts**

Your algorithm will be validated on the Middlebury grayscale dataset, which you can find [here](http://vision.middlebury.edu/flow/data/comp/zip/eval-gray-allframes.zip). Each of these dataset items contains 8 frames of motion. Test your implementation of the Lucas Kanade algorithm on the **Grove**and **Wooden** sets. Make [quiver](https://www.mathworks.com/help/matlab/ref/quiver.html) plots for your optical flow computations. Store these frames as a video file called Grove\_LK and Wooden\_LK, respectively.

Upload the code, a representative quiver plot from each sequence and the videos.

**[Part 2] 30pts**

After this, you compare your output with inbuilt MATLAB implementations of [Lucas-Kanade](https://www.mathworks.com/help/vision/ref/opticalflowlk-class.html), [Farneback](https://www.mathworks.com/help/vision/ref/opticalflowfarneback-class.html" \t "_blank) and [Horn-Schunck](https://www.mathworks.com/help/vision/ref/opticalflowhs-class.html). Evaluate them on the same dataset mentioned in Part 1, and write a report comparing how the different methods behave in textured regions, non-textured regions, and at object boundaries.