

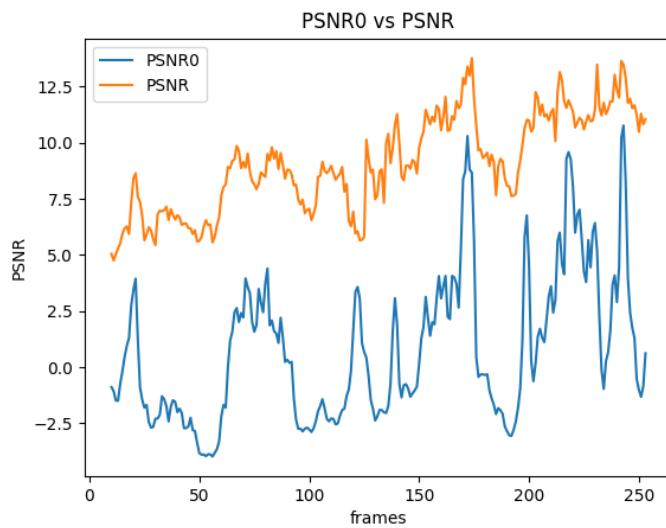
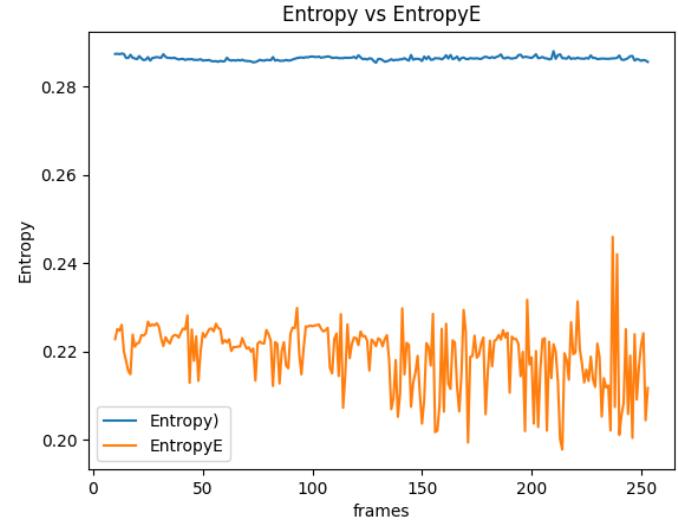
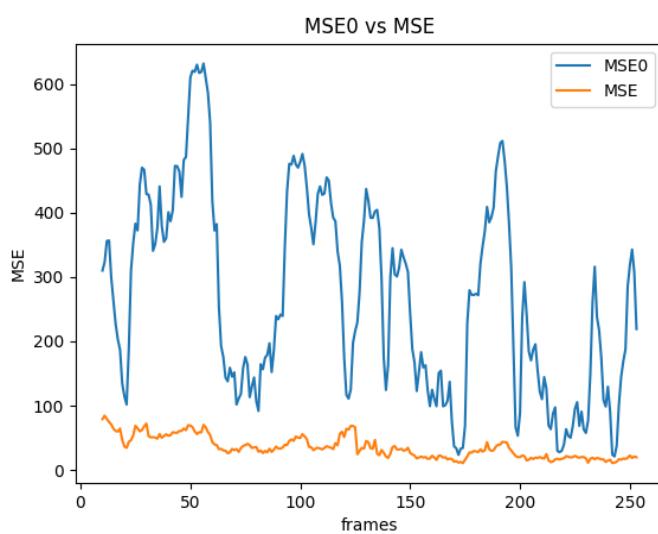
Deep Learning in Computer Vision

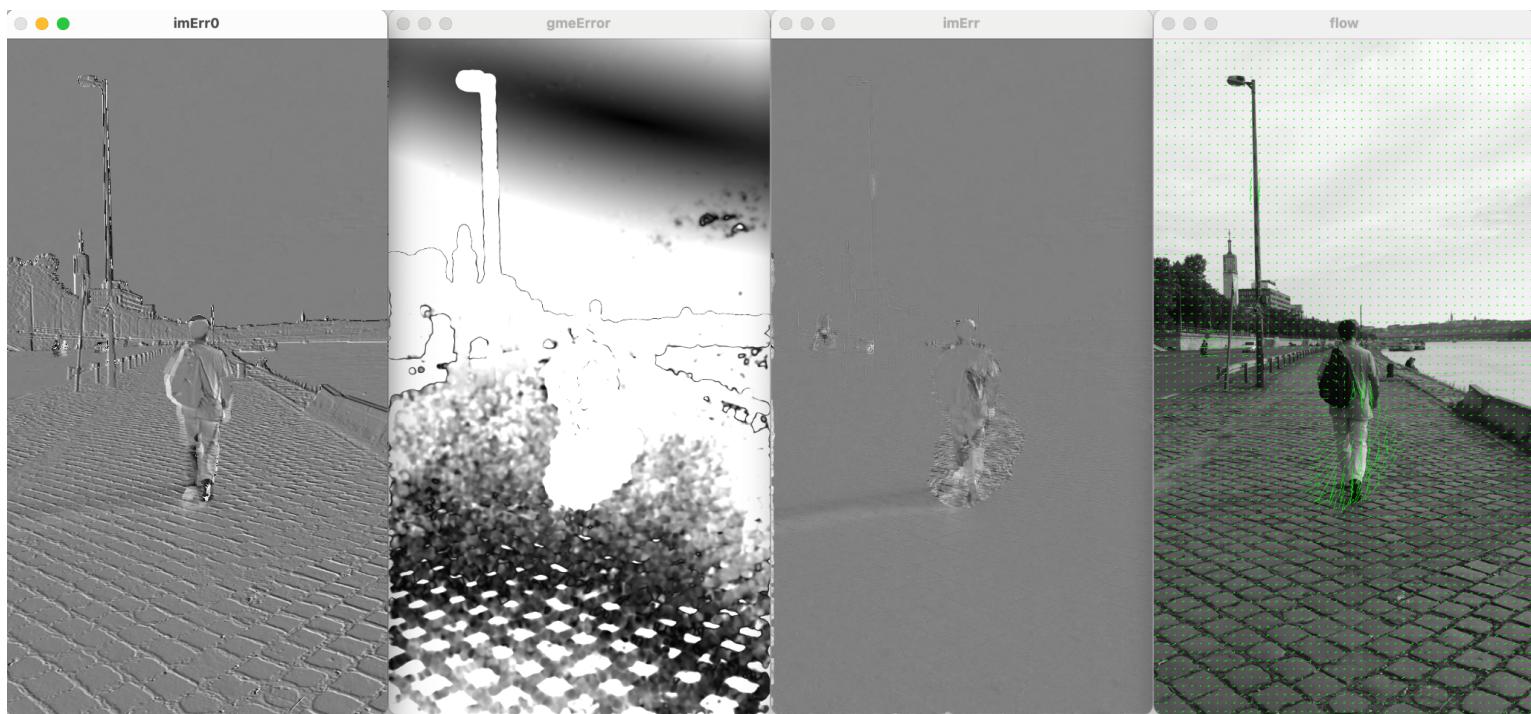
Lab-01
Kush Gupta

To study and measure different metrics of the information content of motion image sequence: MSE, PSNR, and Entropy. To Practice Optical Flow estimation methods with OpenCV Compute Global motion estimation and visualize the distribution of the energy of residual motion.

Video Sequence:

1. PersonConvergence_720.MOV with a delta value (temporal distance) of 10



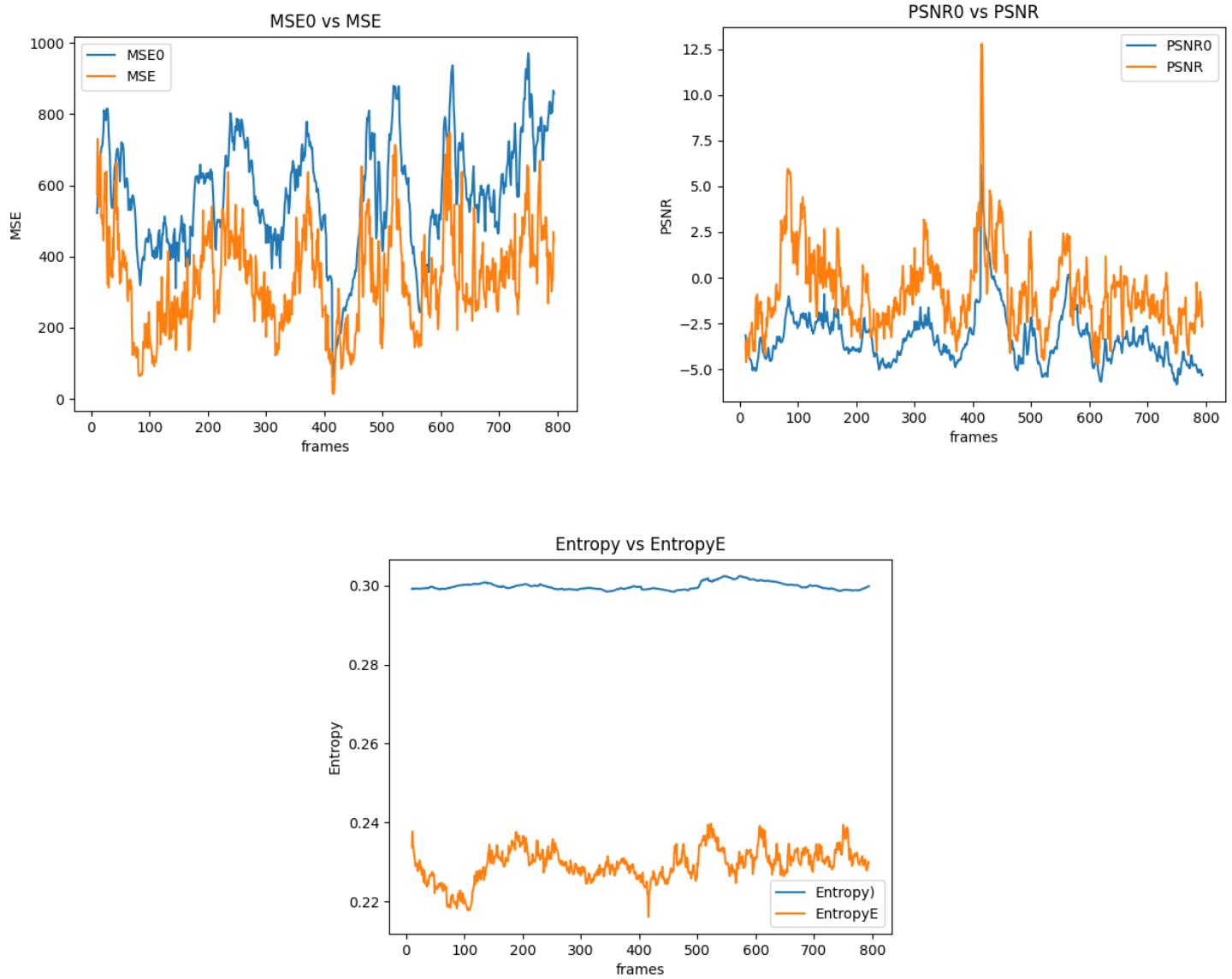


MSE:- While running the video sequence `personconvergence_720` with a temporal distance of 10, I observed that the MSE0 is more than 600 at frame number 50, and after that its value is under 500. The value for MSE stays below 100 for the whole video sequence. The high value of MSE is because we have taken a large step size i.e 10. When I choose a smaller step size 1 I observed that the MSE0 is around 140 at frame 50 and it's mostly below 100 for the remaining frames.

PSNR:- The PSNR value for this video sequence lies between -3 to 9 which means that the video quality was good compared to the second video. For the compensated frame the PSNR lies between 5 to 13, which means the frame quality got improved using the compensated frames.

Entropy:- I observed that the entropy of the error image is under 0.25. It lies between 0.2 to 0.25. The entropy value for the original image is above 0.28 which means that the image contained a lot of noise.

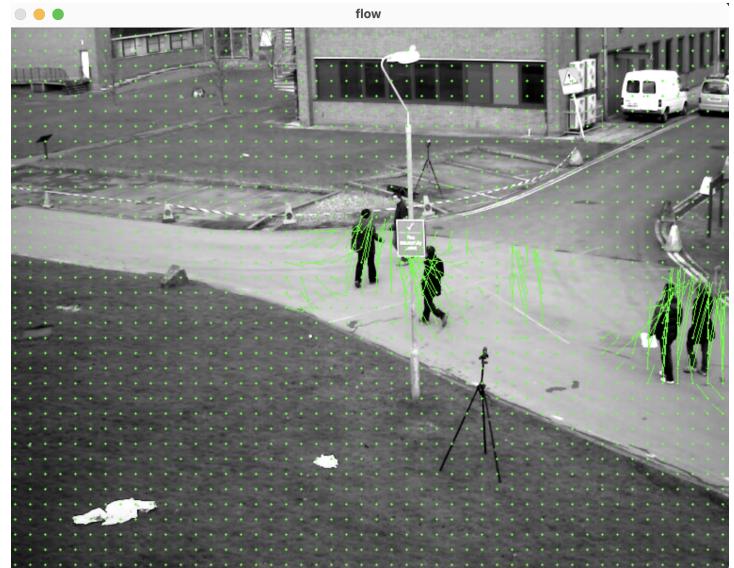
2. Vtest.avi with a delta value (temporal distance) of 10

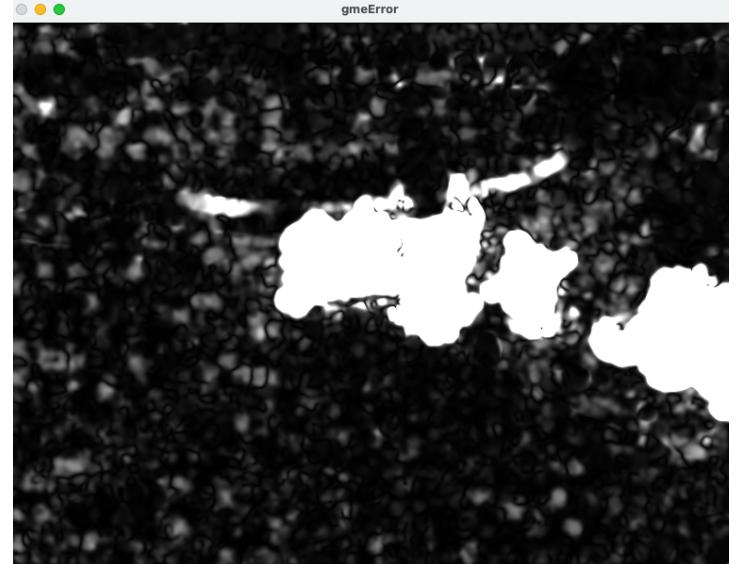


MSE:- It can be observed from the figure that MSE0 is very high due to the large step size and noise in the previous and current frames. The MSE for the compensated frames reduces significantly still it has very large values.

PSNR:- The PSNR0 is between -5 to 5 (approx), which is not a high value but signal to noise ratio but the PSNR lies from -3 to 12.5 which gives a better image quality for the compensated image.

Entropy:- The Entropy for the original image lies around 0.3 and the entropy for the error image lies between 0.22 to 0.24 which gives more information about the image (has better image quality).





Since the processing of the Video on my computer was slow, hence I choose a larger step size 10, so that the video can be processed a bit faster. Also, since it was taking a lot of time, I wasn't able to test the code for all video sequences.