

E9 208 Digital Video: Perception and Algorithms

Assignment 2

(Due Dec 5, 2020)

Note: The assignment needs to be uploaded on Teams. Late submissions will be penalized.

Video Interpolation using Deep Optical Flow

In the given video sequences (to be picked up from the previous assignment), you are required to interpolate a video frame in between two alternate frames using optical flow. In particular, you are required to estimate the forward optical flow (flow from Frame n to Frame $n+2$) and the backward flow (flow from Frame $n+2$ to n) and use both of them to estimate the intermediate Frame n . Compare the performance of deep optical flow algorithms in terms of the quality of the estimated intermediate frame (the reference intermediate frame is already available for this comparison):

1. Any pre-trained optical flow algorithm (Try to get something that works reasonably. While you can record algorithms that perform very poorly in the submission, the final algorithm submission should not produce junk output.)
2. Fine-tuning of the optical flow algorithm on a given pair of frames (Frame n and $n+2$ in this case for example). You can then use the updated optical flow for interpolation. Use an appropriate loss function for this fine tuning.

Other caveats mentioned in the previous assignment continue to hold true: While estimating the interpolated frame, there could be pixels which do not map to any location to either the forward or the backward frame. Present simple heuristics to resolve such situations.

Upload the code and a brief report on the observations on questions raised above. Please show the interpolated frames and comment on the visual performance. Also comment on whether the performance of these methods is better or worse than the classical optical flow algorithms you worked with in the previous assignment.