Neural Inter-Frame Compression for Video Coding
Supplementary Material

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Sequential interpolation approach

In the experimental part of the paper, we compared our interpolation method to a *sequential approach*, for which we provide the details here. First optical flow is separately compressed and decompressed, then the accordingly warped reference frames are provided to an interpolation network. Figure 1 illustrates this sequential strategy. We use PWC-NET [3] to compute optical flow. The autoencoder used to compress motion fields has the same architecture as the compression autoencoders used in the paper. After decoding, the warped reference frames are provided as input to an interpolation network that is based on the GridNet [1].

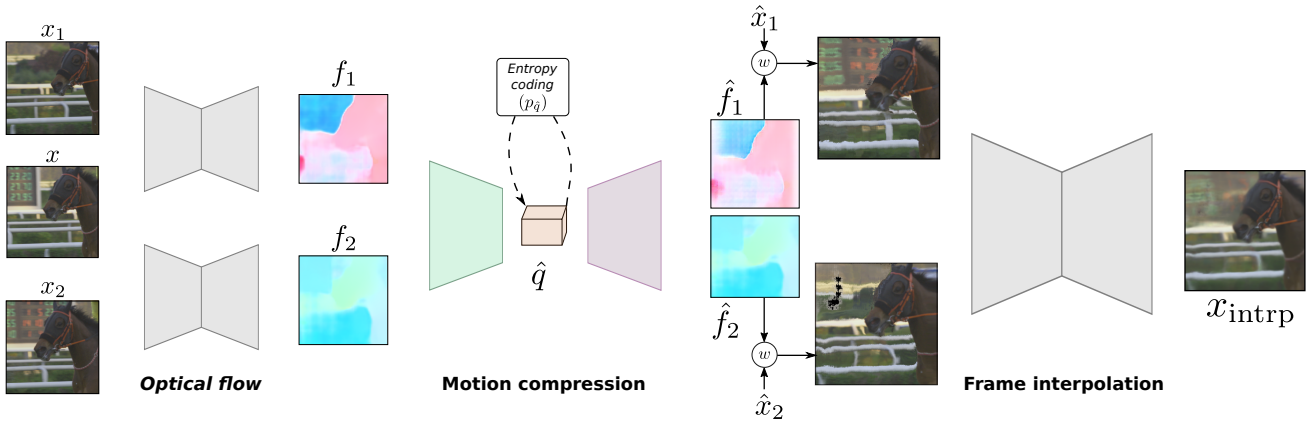

Figure 1: **Sequential interpolation approach.**. In the sequential approach to interpolation, optical flow is computed w.r.t the reference frames x_1 and x_2. The motion fields are compressed using an autoencoder. On the decoding side, the decoded motion field is used to warp the reference frames and then an additional interpolation network is used to estimate x_{intrp}.

Compression commands used for comparisons

For our comparisons with H.265 [2] and H.264 [4] we used *ffmpeg* to compress the frame sequences as follows:

```
$ ffmpeg -i %06d.png -c:v libx265 -pix_fmt yuv420p -x265-params crf=xx:keyint=12 seq.mp4
```

```
$ ffmpeg -i %06d.png -c:v libx264 -pix_fmt yuv420p -crf xx -g 12 -bf 2 -b_strategy 0 -sc_threshold 0  seq.mp4
```

To obtain the *fast* and *medium* modes, we used the following options:

```
... -preset veryfast -tune zerolatency ...
... -preset medium ...
```

References

[1] Simon Niklaus and Feng Liu. Context-aware synthesis for video frame interpolation. In *CVPR*, 2018. 1

[2] Gary J Sullivan, Jens-Rainer Ohm, Woo-Jin Han, Thomas Wiegand, et al. Overview of the high efficiency video coding(hevc) standard. *IEEE Transactions on circuits and systems for video technology*, 2012. 1

[3] Deqing Sun, Xiaodong Yang, Ming-Yu Liu, and Jan Kautz. PWC-Net: CNNs for optical flow using pyramid, warping, and cost volume. In *CVPR*, 2018. 1

[4] Thomas Wiegand, Gary J Sullivan, Gisle Bjontegaard, and Ajay Luthra. Overview of the h. 264/avc video coding standard. *IEEE Transactions on circuits and systems for video technology*, 2003. 1