Supplementary Material for: Deep Unsupervised Similarity Learning using Partially Ordered Sets

Anonymous CVPR submission

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1. Posture Reconstruction in Video: Posets for Finding and Ordering Related Postures

As shown in the main manuscript (Fig. 5), we can also use posets to find and order body postures extracted from other videos to fill gaps between frames of a query sequence. In effect we then represent a video by ordering related postures from other videos. We are not applying any temporal smoothing between successive frames. Moreover, our approach has learned similarities in pose to achieve invariance with respect to changes in appearance of the foreground object (such as skin color, clothing, etc.) and clutter. Thus the posets have learned an ordering of postures, despite differing appearances. The reconstructions will then show the full range of appearances in successive frames.

For a video sequence we sample equidistant samples as representatives $\mathbf{r}_i$, as in our main submission. We then compute posets relative to these $\mathbf{r}_i$ constraining the posets not to include frames from the same sequence that is being reconstructed. In the supplementary we attach sample reconstructions in AVI format for categories *long jump, high jump*, and *snatch* from the Olympic Sports dataset [1].

References

[1] Juan Carlos Niebles, Chih-Wei Chen, and Li Fei-Fei. Modeling temporal structure of decomposable motion segments for activity classification. In *ECCV*, pages 392–405. Springer, 2010. 1