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# Lossless Compression of Video using Motion Compensation

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# Lossless Compression of Video using Motion Compensation

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We investigate lossless coding of video using predictive coding and motion compensation. The new coding methods combine state-of-the-art lossless techniques as in [1] (context based prediction and bias cancellation, Golomb coding) with high resolution motion field estimation, 3d-dimensional predictors, prediction using one or multiple (k) previous images, predictor dependent error modelling, and selection of motion field by code length. We treat the problem of precision of the motion field as one of choosing among a number of predictors. This way, we can incorporate 3d-predictors and intra-frame predictors as well. As in [2], we use bi-linear interpolation in order to achieve sub-pixel precision of the motion field. Using more reference images is another way of achieving higher accuracy of the match. The motion information is coded with the same algorithm as is used for the data. For slow pan or slow zoom sequences, coding methods that use multiple previous images perform up to 20% better than motion compensation using a single previous image and up to 40% better than coding that does not utilize motion compensation.
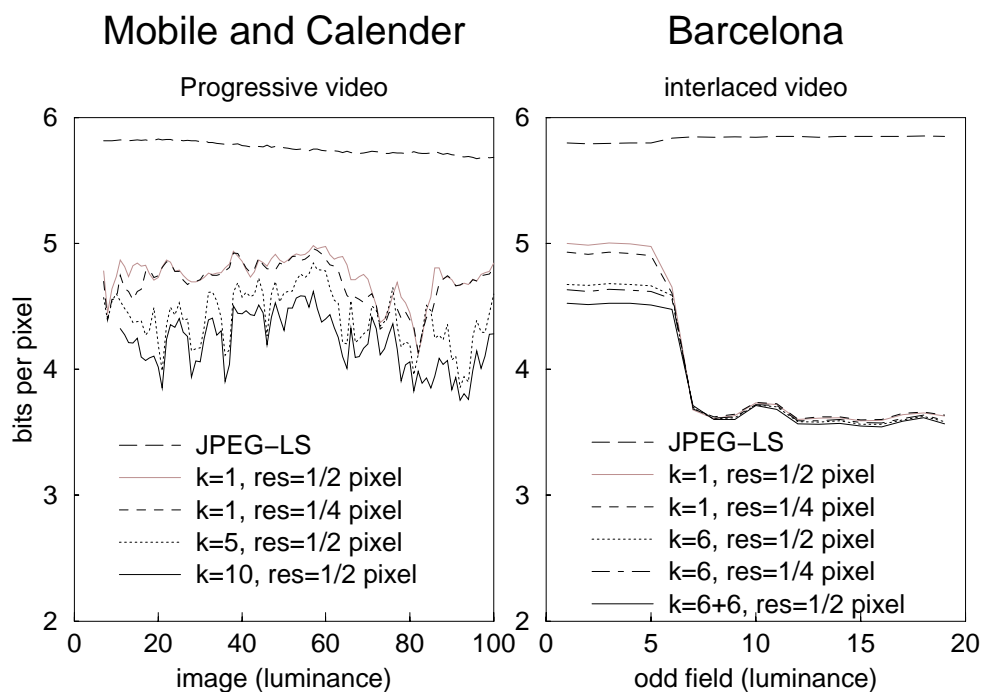
## References

[1] JPEG-LS. CD 14495, Lossless and near-lossless coding of continuous tone still images (JPEG-LS). ISO/IEC Commitee Draft for an International Standard, 1997.

[2] J. Ribas-Corbera. *Optimizing the motion vector accuracies in block-based video coding*. PhD thesis, University of Michigan, 1996.

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