

Joint Video Experts Team (JVET) of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11

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Title: EE5: Cross-check of motion vector coding optimizations

Status: Input document to JVET

Purpose: Proposal

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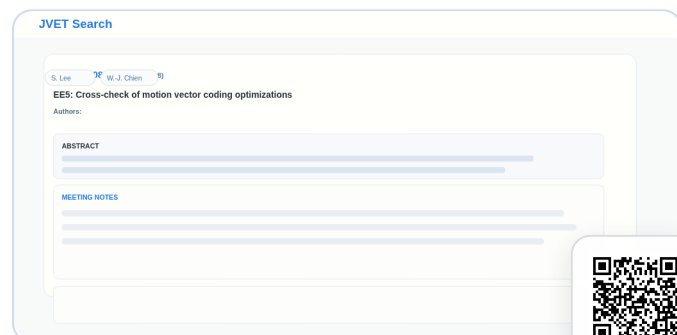
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LINKS

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JVET-D0084

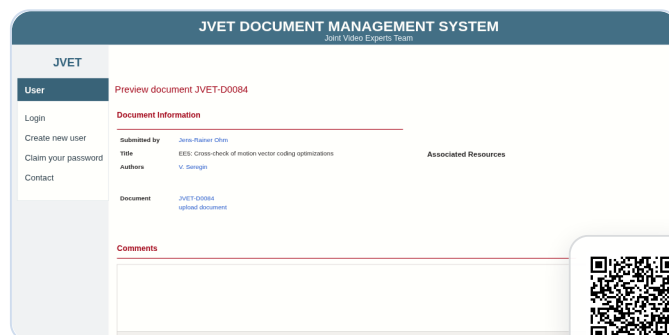
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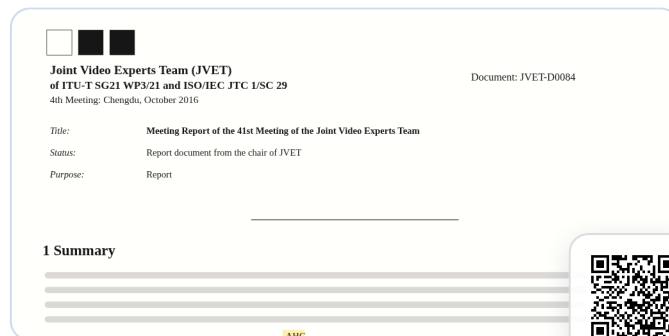
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MEETING NOTES

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MEETING NOTES

[JVET-D0084](#) EE5: Cross-check of motion vector coding optimizations [S. Lee, W.-J. Chien (Qualcomm)]

Related (0)

EE6: Extended Intra Prediction Reference (11)

Primary (9)

From summary report JVET-D0010:

This experiment is targeting to the exploration of extended Intra prediction references to multiple lines, in single line increments, in the following ways:

- Reference tiers are additional lines/columns from non-boundary samples of reference blocks. These may be used instead of the boundary samples.
- Not only the nearest reference line but also further reference lines are utilized in intra prediction. The prediction generated from further reference line will compete with the prediction generated from the nearest reference line in order to choose the best prediction for each block. When further reference line is used, a residue compensation procedure is introduced to further refine the prediction.

Questions recommended to be answered during EE tests:

[Q]: What is the performance of proposed technologies compared to the JEM with the same encoder complexity (full search of 67 Intra prediction modes, for example)?

[A]: EE6-T7 and T8 were designed to give an answer. It is observed that the coding gains out of the farther reference tiers (T2) and the encoder modification of the better encoder (T7) are additive. The coding gain of the combined T2 + T7 (T8) is 0.9% as compared with the better encoder (JEM with more modes, T7), the same as that of T2 as compared with JEM 3.0.

[Q]: Which N (number of lines) (in [JVET-C0043](#)) provides the best tradeoff between performance and complexity?

[A]: EE6-T1, T2 and supplementary test in JVET-D0099 give an answer. According to the results, N = 4 gives a better trade-off on the performance.

- 2 additional lines 0.7% (AI) gain with 1.8 encoder run time increment
- 3 additional lines 0.9% (AI) gain with 2.0 encoder run time increment

[Q]: What are the benefits of residual compensation?

[A]: Difference between EE6-T5 and T3 gives an answer. Residual compensation provides 0.2% (AI) gain.

Conclusion from EE summary: 0.9% gain in (AI) test with 2.0 increment of encoder run time could be achieved by adaptive selection from 4 tiers.

From JVET discussion:

The supplemental test from D0099 reports 0.8% gain with 1.7 encoder run time increase for AI, and 0.5% with 1.17 encoder runtime for RA.

In JVET-D0131, a report is given on further encoder optimization which gives 0.5% for AI with 1.24 encoder runtime, and 0.4% for RA with 1.06 encoder runtime. Cross-check on this is not existing yet.

Overall, these results seem to be different operation points on a more or less continuous rate-distortion vs. complexity graph, and with similar tradeoff as other proposals. Furthermore, there is some impact on the complexity as well at the decoder, as the different tiers have to be accessed.

No action was taken on this.

It is also pointed out that test 7 from the EE gives about 0.4% with 1.7 encoder runtime increase for AI with encoder-only changes.

CITATION

S. Lee, W.-J. Chien, "EE5: Cross-check of motion vector coding optimizations", JVET-D0084, 4th Meeting: Chengdu, October 2016.