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| *Title:* | **CE4 Subtest 2.3.c: QP prediction from spatially neighboring CUs per JCTVC-E391 method 2** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Information | | |
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# Abstract

The contribution presents an independent cross-check of CE4 Subtest 2.3.c, which is an investigation of Method 2 proposed in JCTVC-E391 on QP prediction from spatially neighboring CUs. Simulation results indicate that the target method shows small coding gains from 0.02% to 0.13% on average depending upon the configuration tested.

# Introduction

JCTVC-E391 [1] proposed two methods of QP prediction from spatially neighboring CUs. Method 1 uses the left top-most neighbor CU’s QP as the predictor. If the left top-most neighbor is not available, then the top left-most neighbor CU’s QP is used. There is no mention of what the predictor would be if neither of the candidate neighbor CU’s are available. Inspection of the software suggests that the previous coded QP is used.

Method 2 uses immediate neighbors within a quadtree split CU. Across quadtrees and LCU’s, the rules of Method 1 are used.

The target method for this investigation is HM 3.0 with defaults, which uses the QP of the left CU as predictor, if available, or the previous coded QP. The target method is Method 2 of JCTVC-E391.

# Simulation Results

Simulation results for the anchor were initially generated using HM-3.0-dev-r863-CE4, which was distributed to CE4 participants on May 13, 2011. When a revised version HM-3.0-dev-r863-CE4\_r2 was released we decided to stop the anchor simulation runs with only AI-LC configuration remaining. Instead of restarting the simulation runs for the anchor, we chose to simulate the target method. Because the revised version of the software introduced minor RD differences, we decided to use the anchor data, with exception of run times, provided by Qualcomm [2] instead. For the run times, we used our anchor data which lacks data only for the AI-LC configuration. The BD-rate results match those reported by Qualcomm [2].

Table : BD-Rate Data

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| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | All Intra HE | | | | All Intra LC | | | | | Y | U | V | dQP incr. | Y | U | V | dQP incr. | | Class A | 0.03 | -0.01 | -0.01 | 0.8% | 0.03 | 0.03 | 0.03 | 1.0% | | Class B | 0.01 | 0.05 | 0.03 | 0.4% | 0.00 | 0.00 | 0.00 | 0.0% | | Class C | -0.06 | -0.06 | -0.06 | -1.5% | -0.07 | -0.07 | -0.07 | -1.7% | | Class D | -0.06 | -0.06 | -0.03 | -1.6% | -0.08 | -0.07 | -0.07 | -1.9% | | Class E | -0.02 | 0.00 | -0.02 | -0.5% | -0.03 | -0.03 | -0.03 | -0.7% | | All | -0.02 | -0.02 | -0.01 | -0.4% | -0.03 | -0.03 | -0.03 | -0.6% | | Enc Time[%] | 103% | | | | N/A | | | | | Dec Time[%] | 103% | | | | N/A | | | | |  |  |  |  |  |  |  |  |  | |  | Random Access HE | | | | Random Access LC | | | | | Y | U | V | dQP incr. | Y | U | V | dQP incr. | | Class A | -0.01 | 0.20 | 0.08 | -0.3% | 0.03 | 0.05 | 0.09 | 0.1% | | Class B | -0.04 | -0.15 | 0.02 | -0.6% | -0.03 | -0.07 | -0.05 | -0.9% | | Class C | -0.03 | 0.02 | 0.00 | -2.0% | -0.09 | -0.12 | -0.06 | -2.5% | | Class D | -0.04 | -0.05 | 0.29 | -1.5% | -0.09 | -0.04 | -0.05 | -2.0% | | Class E |  |  |  |  |  |  |  |  | | All | -0.03 | -0.01 | 0.09 | -1.1% | -0.05 | -0.05 | -0.02 | -1.3% | | Enc Time[%] | 103% | | | | 101% | | | | | Dec Time[%] | 106% | | | | 103% | | | | |  |  |  |  |  |  |  |  |  | |  | Low delay B HE | | | | Low delay B LC | | | | | Y | U | V | dQP incr. | Y | U | V | dQP incr. | | Class A |  |  |  |  |  |  |  |  | | Class B | -0.03 | -0.15 | -0.09 | -1.0% | -0.05 | -0.01 | 0.01 | -1.0% | | Class C | -0.10 | -0.04 | 0.01 | -2.3% | -0.15 | -0.09 | -0.11 | -2.7% | | Class D | -0.08 | -0.25 | -0.18 | -1.7% | -0.15 | -0.33 | -0.14 | -2.2% | | Class E | -0.13 | -1.18 | 0.59 | -2.7% | -0.19 | -0.38 | 0.03 | -2.8% | | All | -0.08 | -0.34 | 0.04 | -1.8% | -0.13 | -0.18 | -0.05 | -2.0% | | Enc Time[%] | 102% | | | | 104% | | | | | Dec Time[%] | 104% | | | | 105% | | | | |

The results indicate that the target method shows small coding gains from 0.02% to 0.13% on average depending upon the configuration tested.

# References

1. M. Coban, W. Chien, and M. Karczewicz, “CU-Level QP Prediction,” JCT-VC Document, JCTVC-E391, Geneva, March 2011.
2. M. Coban and M. Karczewicz, “CE4 Subtest 2: QP prediction from spatially neighboring CUs (test 2.3.b, 2.3.c),” JCT-VC Document, JCTVC-F332, Torino, July 2011.