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| *Title:* | **AHG9: Cross-check of JCTVC-J0222: Improved Weighted Prediction Parameter Signalling** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Report | | |
| *Author(s) or Contact(s):* | Yong He 9710 Scranton Rd, #250 San Diego, CA 92121 | Tel: Email: | +1-858-210-4807 [yong.he@interdigital.com](mailto:Yong.he@interdigital.com) |
| *Source:* | InterDigital Communications, LLC | | |

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# Abstract

This contribution reports cross-checking results on the improved weighted prediction parameter signaling.

In the JCTVC-J0222 proposal, a flag of delta\_wp\_param\_signaling\_flag is inserted in syntax elements of WP parameters for List 1. If this flag is equal to 1, the conventional WP parameter signaling for List 1 is used. Otherwise, an additional index of wp\_delta\_ref\_idx is explicitly signaled in pred\_weight\_table syntax.

The verification task has been done successfully and the results match those provided by proponent.

The experimental results in HM software version 7.0 with weighted prediction under common test conditions are reported. The results show that BD-bitrate loss for both black/white-fade sequences are -0.1%, -1.2%, -0.2% and -1.9% for RA-MP, LDB-MP, RA-HE10 and LDB-HE10 compared with conventional WP method on average, respectively. It is reported that these schemes does not affect the encoding and decoding time.

# Cross-checking

The software based on HM version 7.0 and the experimental results were provided on July 2nd, 2012 by Toshiba. The software was compiled fine and the cross-checking was performed on 64bit linux environment. The simulation has been conducted under common test conditions [1] for Main profile (MP) conditions and high efficiency (HE10) conditions in the case of random access (RA) and low delay B (LB) coding structures using black/white-fade sequences provided by [2].

The anchors were generated using the released HM7.0. One macro “WP\_PARAM\_PRED\_FROM\_L0” provided by the proponent was set as follows:

*#define WP\_PARAM\_PRED\_FROM\_L0 1*

# Results

Table 1 and Table 2 show BD-bitrate and relative average encoding/decoding time for the proposed signalling compared with HM7.0 weighted prediction anchor.

Table 1: BD-bitrate[%] and relative encoding/decoding time[%] of **the proposed method**

compared with HM7.0 WP anchor for **black-fade sequences**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | |  | |  | |  | |  | |  | |
|  | | **Random Access Main** | | | | | | **Random Access HE10** | | | | | |
|  | | Y | | U | | V | | Y | | U | | V | |
| Class A | | 0.0% | | 0.0% | | 0.0% | | 0.0% | | 0.0% | | 0.0% | |
| Class B | | -0.1% | | 0.0% | | 0.0% | | -0.1% | | -0.1% | | -0.1% | |
| Class C | | -0.1% | | -0.1% | | -0.1% | | -0.2% | | -0.2% | | -0.2% | |
| Class D | | -0.4% | | -0.4% | | -0.4% | | -0.7% | | -0.6% | | -0.6% | |
| Class E | |  | |  | |  | |  | |  | |  | |
| **Overall** | | -0.1% | | -0.1% | | -0.1% | | -0.2% | | -0.2% | | -0.2% | |
|  | | -0.1% | | -0.1% | | -0.1% | | -0.2% | | -0.2% | | -0.2% | |
| Class F | | #VALUE! | | #VALUE! | | #VALUE! | | #VALUE! | | #VALUE! | | #VALUE! | |
| Enc Time[%] | | 106% | | | | | | 113% | | | | | |
| Dec Time[%] | | 94% | | | | | | 112% | | | | | |
|  | |  | |  | |  | |  | |  | |  | |
|  | | **Low delay B Main** | | | | | | **Low delay B HE10** | | | | | |
|  | | Y | | U | | V | | Y | | U | | V | |
| Class A | |  | |  | |  | |  | |  | |  | |
| Class B | | -0.3% | | -0.3% | | -0.3% | | -0.5% | | -0.4% | | -0.4% | |
| Class C | | -0.7% | | -0.6% | | -0.6% | | -1.0% | | -0.9% | | -0.9% | |
| Class D | | -2.1% | | -1.9% | | -2.0% | | -3.3% | | -3.0% | | -3.0% | |
| Class E | | -2.2% | | -1.9% | | -1.9% | | -3.8% | | -3.4% | | -3.4% | |
| **Overall** | | -1.2% | | -1.1% | | -1.1% | | -1.9% | | -1.7% | | -1.7% | |
|  | | -1.2% | | -1.1% | | -1.1% | | -1.9% | | -1.8% | | -1.8% | |
| Class F | | #VALUE! | | #VALUE! | | #VALUE! | | #VALUE! | | #VALUE! | | #VALUE! | |
| Enc Time[%] | | 112% | | | | | | 109% | | | | | |
| Dec Time[%] | | 110% | | | | | | 108% | | | | | |

Table 2: BD-bitrate[%] and relative encoding/decoding time[%] of **the proposed method**

compared with HM7.0 WP anchor for **white-fade sequences**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Random Access Main** | | | **Random Access HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Class B | -0.1% | -0.1% | -0.1% | -0.1% | -0.1% | -0.1% |
| Class C | -0.2% | -0.1% | -0.1% | -0.3% | -0.2% | -0.2% |
| Class D | -0.5% | -0.5% | -0.5% | -0.8% | -0.8% | -0.8% |
| Class E |  |  |  |  |  |  |
| **Overall** | -0.2% | -0.2% | -0.2% | -0.3% | -0.3% | -0.3% |
|  | -0.2% | -0.2% | -0.2% | -0.3% | -0.3% | -0.3% |
| Class F | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| Enc Time[%] | 105% | | | 108% | | |
| Dec Time[%] | 96% | | | 109% | | |
|  |  |  |  |  |  |  |
|  | **Low delay B Main** | | | **Low delay B HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A |  |  |  |  |  |  |
| Class B | -0.4% | -0.3% | -0.3% | -0.6% | -0.5% | -0.5% |
| Class C | -0.8% | -0.8% | -0.8% | -1.2% | -1.1% | -1.1% |
| Class D | -2.7% | -2.4% | -2.5% | -3.8% | -3.4% | -3.5% |
| Class E | -2.9% | -2.4% | -2.5% | -4.3% | -3.9% | -4.0% |
| **Overall** | -1.5% | -1.4% | -1.4% | -2.2% | -2.0% | -2.1% |
|  | -1.5% | -1.4% | -1.4% | -2.3% | -2.0% | -2.1% |
| Class F | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| Enc Time[%] | 104% | | | 111% | | |
| Dec Time[%] | 103% | | | 108% | | |

# Conclusion

We cross-checked the clean-up text of the weighted prediction syntax and semantics proposed by Toshiba. We confirm the results presented in JCTVC-J0222.

# References

1. F. Bossen, “Common HM test conditions and software reference configurations”, Document no JCTVC-I1100. May 2012.
2. AHG report, " JCT-VC AHG report: Weighted prediction (AHG 18)," Joint Collaborative Team on Video Coding, JCTVC-F018, Torino, July 2011.