|  |  |
| --- | --- |
| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  19th Meeting: Strasbourg, FR, 17–24 Oct 2014 | Document: JCTVC-S0217 |

|  |  |  |  |
| --- | --- | --- | --- |
| *Title:* | **Non-CE6: Cross-check of JCTVC-S0110 on Syntax Redundancy Fixes for Palette Mode** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Report | | |
| *Author(s) or Contact(s):* | Yuwen He, Xiaoyu Xiu, Yan Ye 9710 Scranton Rd, #250 San Diego, CA 92121, USA | Tel: Email: | +1-858-210-4819 [yuwen.he@interdigital.com](mailto:yuwen.he@interdigital.com)  xiaoyu.xiu@interdigital.com  [yan.ye@interdigital.com](mailto:yan.ye@interdigital.com) |
| *Source:* | InterDigital Communications, Inc. | | |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Abstract

This documents reports the crosscheck results for Non-CE6 proposal JCTVC-S0110 on syntax redundancy fixes for palette mode. The source code provided by the proponents was verified to be consistent with the description in JCTVC-S0110. The rate-distortion performance was evaluated with CE6 test conditions JCTVC-R1106 and matches the one provided in JCTVC-S0110.

# Introduction

JCTVC-S0110 [2] proposed a modified copy above mode to fix the syntax redundancy for palette coding. The copy above mode is modified when the neighboring is run mode and left neighboring pixel and above neighboring pixel are the same and both are not escape colors.

# Simulation results

The performance of the modified copy mode described in Section 1.3 of JCTVC-S0110 is cross-checked according to CE6 test conditions [1] and is summarized below. The detailed results can be found in the attached excel datasheets.

Table 1. Average BD rate reduction for lossy coding compared with CE6 anchors

|  |  |  |  |
| --- | --- | --- | --- |
|  | **All Intra** | | |
|  | G/Y | B/U | R/V |
| RGB, text & graphics with motion, 1080p | -0.3% | -0.3% | -0.3% |
| RGB, text & graphics with motion,720p | -0.2% | -0.2% | -0.2% |
| RGB, mixed content, 1440p | 0.0% | 0.0% | -0.1% |
| RGB, mixed content, 1080p | 0.0% | 0.0% | 0.0% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | -0.4% | -0.3% | -0.3% |
| YUV, text & graphics with motion,720p | -0.1% | -0.2% | -0.2% |
| YUV, mixed content, 1440p | 0.0% | -0.1% | -0.1% |
| YUV, mixed content, 1080p | -0.1% | 0.0% | -0.1% |
| YUV, Animation, 720p | 0.0% | -0.1% | -0.1% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 95% | | |
| Dec Time[%] | 91% | | |
|  |  |  |  |
|  | **Random Access** | | |
|  | G/Y | B/U | R/V |
| RGB, text & graphics with motion, 1080p | -0.2% | -0.2% | -0.2% |
| RGB, text & graphics with motion,720p | -0.1% | -0.2% | -0.1% |
| RGB, mixed content, 1440p | 0.0% | -0.1% | -0.1% |
| RGB, mixed content, 1080p | 0.0% | -0.1% | 0.0% |
| RGB, Animation, 720p | -0.1% | -0.1% | -0.1% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | -0.2% | -0.2% | -0.2% |
| YUV, text & graphics with motion,720p | -0.1% | -0.2% | -0.2% |
| YUV, mixed content, 1440p | 0.0% | 0.0% | 0.0% |
| YUV, mixed content, 1080p | 0.0% | -0.2% | -0.1% |
| YUV, Animation, 720p | -0.1% | -0.1% | -0.1% |
| YUV, camera captured, 1080p | 0.0% | 0.1% | 0.0% |
| Enc Time[%] | 98% | | |
| Dec Time[%] | 95% | | |
|  |  |  |  |
|  | **Low delay B** | | |
|  | G/Y | B/U | R/V |
| RGB, text & graphics with motion, 1080p | -0.2% | -0.2% | -0.1% |
| RGB, text & graphics with motion,720p | 0.0% | -0.2% | -0.2% |
| RGB, mixed content, 1440p | 0.0% | -0.1% | -0.3% |
| RGB, mixed content, 1080p | 0.1% | 0.3% | 0.5% |
| RGB, Animation, 720p | -0.1% | 0.1% | 0.1% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | -0.1% | -0.2% | -0.2% |
| YUV, text & graphics with motion,720p | -0.1% | -0.2% | -0.4% |
| YUV, mixed content, 1440p | 0.0% | -0.2% | 0.0% |
| YUV, mixed content, 1080p | 0.0% | 0.1% | -0.5% |
| YUV, Animation, 720p | 0.1% | -0.2% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.1% | 0.1% |
| Enc Time[%] | 96% | | |
| Dec Time[%] | 91% | | |

Table 2. Average BD rate reduction for lossless coding compared with CE6 anchors

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All Intra** | | | |
|  | Bit-rate saving (Total) | Bit-rate saving (Average) | Bit-rate saving (Min) | Bit-rate saving (Max) |
|  |
| RGB, text & graphics with motion, 1080p | 0.1% | 0.2% | 0.1% | 0.2% |
| RGB, text & graphics with motion,720p | 0.1% | 0.1% | 0.0% | 0.2% |
| RGB, mixed content, 1440p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, mixed content, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | 0.2% | 0.2% | 0.0% | 0.2% |
| YUV, text & graphics with motion,720p | 0.1% | 0.1% | 0.0% | 0.2% |
| YUV, mixed content, 1440p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, mixed content, 1080p | 0.1% | 0.1% | 0.1% | 0.1% |
| YUV, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 95% | | | |
| Dec Time[%] | 93% | | | |
|  |  |  |  |  |
|  | **Random Access** | | | |
|  | Bit-rate saving (Total) | Bit-rate saving (Average) | Bit-rate saving (Min) | Bit-rate saving (Max) |
|  |
| RGB, text & graphics with motion, 1080p | 0.0% | 0.1% | 0.0% | 0.2% |
| RGB, text & graphics with motion,720p | 0.0% | 0.0% | 0.0% | 0.1% |
| RGB, mixed content, 1440p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, mixed content, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | 0.0% | 0.1% | 0.0% | 0.2% |
| YUV, text & graphics with motion,720p | 0.0% | 0.0% | 0.0% | 0.1% |
| YUV, mixed content, 1440p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, mixed content, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 92% | | | |
| Dec Time[%] | 91% | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Low Delay B** | | | |
|  | Bit-rate saving (Total) | Bit-rate saving (Average) | Bit-rate saving (Min) | Bit-rate saving (Max) |
|  |
| RGB, text & graphics with motion, 1080p | 0.0% | 0.1% | 0.0% | 0.3% |
| RGB, text & graphics with motion,720p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, mixed content, 1440p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, mixed content, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | 0.0% | 0.1% | 0.0% | 0.2% |
| YUV, text & graphics with motion,720p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, mixed content, 1440p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, mixed content, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 93% | | | |
| Dec Time[%] | 93% | | | |

# References

1. Y.-W. Huang, P. Onno, R. Cohen, V. Seregin, X. Xiu, Z. Ma, “Description of Core Experiment 6 (CE6): Improvements of palette mode”, JCTVC-R1106, Jul. 2014, Sapporo, JP.
2. W. Pu, M. Karczewicz, V. Seregin, F. Zou, R. Joshi, J. Sole, “Non-CE6: Syntax Redundancy Fixes for Palette Mode”, JCTVC-S0110, Oct. 2014.