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| *Title:* | **CE6.h related : Removal of Overlap between DMM1 and DMM3** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
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# Abstract

This contribution proposes to remove overlap between DMM1 and DMM3. In DMM3, when co-located texture luma block (CTLB) is not intra coded with mode 2~34, similar method with DMM1 is employed and the main difference between DMM3 and DMM1 is that a coarser wedgelet pattern sets is used in DMM3. Therefore, there is overlap between DMM1 and DMM3. To remove the overlap, this contribution proposes to disable DMM3 when CTLB is not intra coded with mode 2~34. It is reported that there is no compress performance loss in both CTC and All Intra case.

# Introduction

In the HTM-6.0, the DMM3 coding mode is processed in two branches depending on coding mode of the CLTB [1]:

1. When CTLB is intra coded with mode 2~34

Only a small predefined candidate Wedgelet pattern set is searched and the index of the best pattern is encoded.

1. Otherwise, when CTLB is not intra coded or intra coded with mode 0 or 1,

The coarse candidate Wedgelet pattern set is searched and the index of the best pattern is encoded.

In the case that CTLB is not intra coded or intra coded with mode 0 or 1, DMM3 uses similar method with DMM1 and the main difference between DMM3 and DMM1 is that a coarser wedgelet pattern sets is used in DMM3. Therefore, there is overlap between DMM1 and DMM3.

# Proposed Method

To remove the overlap between DMM1 and DMM3, we propose to disable DMM3 in case that CTLB is not intra coded or intra coded with mode 0 or 1. Therefore, DMM3 is simplified to:

1. When CTLB is intra coded with mode 2~34

Only a small predefined candidate Wedgelet pattern set is searched and the index of the best pattern is encoded.

1. Otherwise, DMM3 is disabled

# 3 Experimental Results

Proposed method is implemented into HTM 6.0 software, and proposed method is compared with HTM 6.0 under both CTC and All Intra Condition [2]. It can be seen that there is no coding efficiency loss after removing the overlap between DMM1 and DMM3.

Table 1: comparison of HTM-6.0 with proposed method (CTC)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | video 0 | video 1 | video 2 | video PSNR / video bitrate | video PSNR / total bitrate | synth PSNR / total bitrate | enc time | dec time |
| Balloons | 0.0% | -0.08% | -0.05% | -0.02% | -0.03% | -0.05% | 101.6% | 100.1% |
| Kendo | 0.0% | -0.01% | 0.15% | 0.02% | 0.00% | 0.02% | 104.0% | 99.9% |
| Newspaper\_CC | 0.0% | -0.13% | 0.09% | -0.01% | -0.01% | -0.01% | 99.2% | 100.1% |
| GT\_Fly | 0.0% | -0.02% | 0.12% | 0.02% | 0.03% | 0.01% | 101.4% | 99.9% |
| Poznan\_Hall2 | 0.0% | -0.08% | -0.27% | -0.10% | -0.14% | -0.06% | 100.8% | 100.0% |
| Poznan\_Street | 0.0% | 0.10% | 0.11% | 0.05% | 0.04% | 0.03% | 100.4% | 100.2% |
| Undo\_Dancer | 0.0% | 0.02% | -0.04% | 0.00% | 0.01% | -0.35% | 101.5% | 99.9% |
| 1024x768 | 0.0% | -0.07% | 0.06% | 0.00% | -0.01% | -0.02% | 101.6% | 100.0% |
| 1920x1088 | 0.0% | 0.01% | -0.02% | -0.01% | -0.02% | -0.09% | 101.0% | 100.0% |
| **average** | **0.0%** | **-0.03%** | **0.02%** | **0.00%** | **-0.01%** | **-0.06%** | **101.3%** | **100.0%** |

Table 2: comparison of HTM-6.0 with proposed method (all intra)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | video 0 | video 1 | video 2 | video PSNR / video bitrate | video PSNR / total bitrate | synth PSNR / total bitrate | enc time | dec time |
| Balloons | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.04% | 92.8% | 100.1% |
| Kendo | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.02% | 92.9% | 100.2% |
| Newspaper\_CC | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.02% | 94.7% | 99.9% |
| GT\_Fly | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | -0.01% | 94.2% | 99.9% |
| Poznan\_Hall2 | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | -0.02% | 95.1% | 100.1% |
| Poznan\_Street | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.01% | 94.5% | 99.9% |
| Undo\_Dancer | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 93.7% | 100.0% |
| 1024x768 | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.02% | 93.5% | 100.1% |
| 1920x1088 | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | -0.01% | 94.4% | 100.0% |
| **average** | **0.0%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.01%** | **94.0%** | **100.0%** |

# Conclusion

This contribution proposes to remove the overlap between DMM1 and DMM3, and it has no compression efficiency loss. We recommend that proposed method is adopted into 3DV-HEVC.

# Reference

[1] G. Tech, K. Wegner, Y. Chen, S.Yea, “3D-HEVC Test Model 3”, Doc. JCT3V-C1005, Geneva, Swizerland, 17–23 Jan. 2013.

[2] D. Rusanovskyy, K. Müller, A. Vetro, “Common Test Conditions of 3DV Core Experiments”, Doc. JCT3V-C1100, Geneva, Swizerland, 17–23 Jan. 2013.

# Patent rights declaration(s)

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