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| **Joint Collaborative Team on 3D Video Coding Extension Development**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  5th Meeting: Vienna, AT, 27th Jul – 2nd Aug. 2013 | Document: JCT3V-E0167 |

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| *Title:* | **3D-CE6.h related: Simplified SDC prediction** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
| *Author(s) or Contact(s):* | Jian-Liang Lin1, Yi-Wen Chen1,  Kai Zhang2, Yu-Wen Huang1, Shawmin Lei1  1 MediaTek Hsinchu No. 1, Dusing Rd. 1, Hsinchu Science Park, Hsinchu, Taiwan 30078  2 MediaTek Beijing Building 1-B, No.6 Park, Jiuxianqiao Road, Chaoyang District, Beijing, China, 100015 | Tel: Email: | Shawmin Lei +886-3-5670766 ext. 25555 {jl.lin, yiwen.chen, kai.zhang yuwen.huang, shawmin.lei} @mediatek.com |
| *Source:* | MediaTek Inc. | | |

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# Abstract

The simplified depth coding (SDC) is utilized as an alternative intra coding mode in 3D-HEVC. In DC mode and Planar mode of SDC, the mean of the prediction samples of current depth block need to be calculated and used as the input of a depth lookup table to derive an index value. In this proposal, it is proposed to simply use a single prediction sample, which is the center sample of current depth block, instead of deriving the mean of all prediction samples. With this simplification, a sub-sampling calculation of the mean of the prediction samples can be removed. The experimental results reportedly show no coding loss under the common tests conditions and all-intra test conditions.

# Introduction

In 3D-HEVC, the simplified depth coding (SDC) is applied as an alternative intra coding mode [1]. For SDC, the prediction samples () of the current depth block are generated by the conventional intra prediction or DMM intra prediction. The possible intra modes used in SDC are listed as the follows:

1. DC mode (1 partition)
2. DMM mode 1 (2 partitions)
3. Planar mode (1 partition)

Instead of transmitting quantized transform coefficients to represent the residual signal, the residual of each partition in the current depth block is coded by transmitting a constant residual value to the decoder.

In the current design of SDC, the input is a predicting depth value (), which is the mean of the prediction samples of the current depth block generated by intra prediction with mode DC, DMM mode 1, or Planar mode. A depth lookup table (DLT) is used to map the to an index value.

To reduce the computing complexity in SDC, a sub-sampling method for the calculation of the mean value is applied in current 3D-HEVC. As shown in Fig. 1, the predicting depth value is calculated as the mean of the sub-samples marked as grey colour.



**Fig. 1. 2:1 sub-sampling for the reference samples [2]**

# Proposed method

In this proposal, we propose to further simply the derivation of the predicting depth value. In DC mode and Planar mode of SDC, the center prediction sample in current depth block is directly used as the predicting depth value to represent the mean of the prediction samples of current depth block as shown in Fig. 2.



**Fig. 2. The proposed simplification by directly using the center prediction sample to represent the predicting depth value**

# Experimental results

The proposed simplification is conducted based on HTM-7.0r1 [3] under the common test conditions (CTC) [4] and all-intra test conditions [5]. The experimental results of the proposed method under the common test conditions and under the all-intra test conditions are shown in Table 1 and Table 2, respectively. The experiments results show that the proposed simplification brings no coding loss, while the sum and average operations in the derivation of the predicting depth value can totally be removed.

**Table 1. Experimental results of the proposed simplification (CTC)**



**Table 2. Experimental results of the proposed simplification (All-intra)**



# Conclusion

In this proposal, instead of deriving the mean of all prediction samples for SDC, it is proposed to directly use a single center prediction sample in current depth block as the input to the depth look table. With this simplification, the sub-sampling calculation of the mean of the prediction samples is removed. The experimental results show no coding loss in the common test conditions and all-intra test condition.

# Patent rights declaration(s)

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# References

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