

Title: **CE6.h related: SDC coding for 64x64 blocks**

Status: Input Document

Purpose: Proposal

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Abstract

This document presents results on SDC signaling for 64x64 blocks. This proposal suggests incorporating DC and planar modes of SDC into the conventional angular intra coding approach. Two modes which are the least selected from the pre-experiment are substituted with such SDC modes. Binarization of depth intra modes can be skipped by this method. Tests were conducted using HTM-7.0r1 under CTC. Simulation results report 0.1% gain for both video and synthesis.

1 Introduction

Simplified depth coding (SDC) is an alternative depth intra coding approach which employs three modes: DC, planar and DMM. Residual value for each segment is signaled in the bitstream. For depth intra coding of 64x64 blocks, chain coding mode, DMM modes, DMM mode of SDC are not used.

2 SDC coding for 64x64 blocks

In the unified signaling of depth intra modes, DMM, SDC and the chain coding mode are signaled by `depth_intra_mode` [1]. Based on the value of this element, other additional information is signaled, e.g., wedgelet parameters and delta DCs.

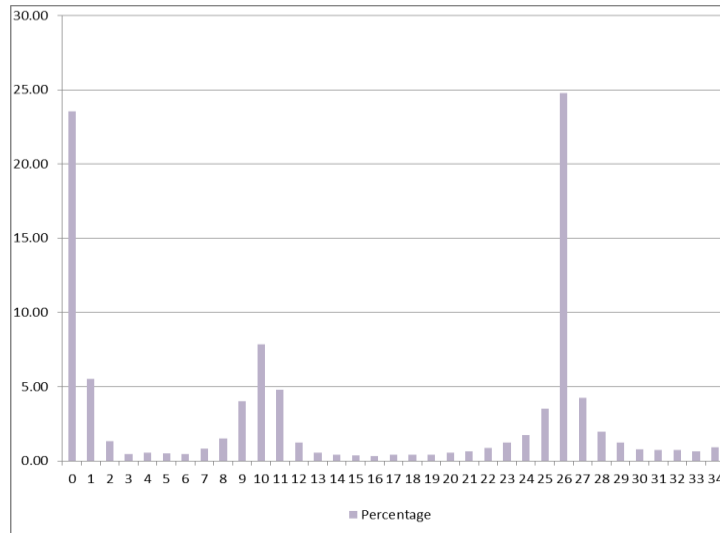
Table 1 represents binarization of depth intra modes for 64x64 blocks. Three types of bin strings are defined to represent SDC_DC, SDC_PLANAR and normal HEVC intra modes. The proposed approach incorporates SDC_DC and SDC_PLANAR into the normal HEVC intra modes. Consequently, binarization of depth intra modes for 64x64 blocks is longer needed.

An experiment was conducted to determine which of the modes are the least used, and thus, replaceable. Figure 1 shows the selected percentages of normal intra modes in depth coding. This was evaluated at the decoder side using all 4 QPs and 7 test sequences. Modes 15 and 16 were the least used, 0.30% and 0.36%, respectively. Hence, such two angular intra prediction modes are substituted by SDC_DC and SDC_PLANAR. If MPM includes DC or planar, MPM is coded rather than SDC modes in this case.

Table 1. Binarization of depth intra modes for 64x64 blocks

Name of depth_intra_mode	Bin String
	cLog2CbSize == 6
INTRA_DEP_SDC_PLANAR	0
INTRA_DEP_NONE	10
INTRA_DEP_SDC_DMM_WFULL	-
INTRA_DEP_DMM_WFULL	-
INTRA_DEP_DMM_CPREDTEX	-
INTRA_DEP_DMM_WPREDTEX	-
INTRA_DEP_SDC_DC	11
INTRA_DEP_DMM_WPREDDIR	-
INTRA_DEP_CHAIN	-

Figure 1. Selected percentages of normal HEVC intra modes in depth coding



3 Simulation Results

Table 2 shows the results under CTC [2]. Simulation results report 0.1% gain for both video and synthesis.

Table 2. Results under 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%	-0.1%	0.1%	0.0%	0.0%	-0.1%	99.3%	101.1%
Kendo	0.0%	0.3%	0.0%	0.1%	-0.1%	-0.2%	99.6%	98.8%
Newspaper_CC	0.0%	0.0%	-0.1%	0.0%	-0.1%	0.1%	99.7%	100.3%
GT_Fly	0.0%	0.2%	0.0%	0.0%	-0.2%	-0.2%	99.8%	100.3%
Poznan_Hall2	0.0%	-0.1%	0.1%	0.0%	-0.3%	-0.4%	99.6%	99.1%
Poznan_Street	0.0%	-0.1%	-1.3%	-0.2%	-0.2%	-0.2%	99.7%	99.7%
Undo_Dancer	0.0%	0.1%	0.2%	0.0%	-0.1%	0.0%	99.8%	99.1%
1024x768	0.0%	0.1%	0.0%	0.0%	-0.1%	-0.1%	99.5%	100.1%
1920x1088	0.0%	0.0%	-0.3%	0.0%	-0.2%	-0.2%	99.7%	99.5%
average	0.0%	0.0%	-0.2%	0.0%	-0.1%	-0.1%	99.7%	99.8%

4 Conclusion

This document reported the results of SDC signaling for 64x64 blocks. SDC_DC and SDC_PLANAR were included in the conventional intra prediction modes, substituting Mode 15 and Mode 16 which are the least selected modes. This allows binarization of depth intra modes to be unnecessary. From the evaluation using HTM-7.0r1 under CTC, 0.1% gain was achieved for both video and synthesis results.

5 Reference

- [1] G. Tech, K. Wegner, Y. Chen, and S. Yea, "3D-HEVC Test Model 4," JCT3V-D1005, Incheon, KR, April 2013.
- [2] D. Rusanovskyy, K. Muller, and A. Vetro, "Common Test Conditions of 3DV Core Experiments," JCT3V-D1100, Incheon, KR, April 2013.

6 Patent rights declaration(s)

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