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| *Title:* | **CE6.h related SDC with WVSO metric** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
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# Abstract

In the 2nd JCT-3Vmeeting, WVSO(Weighted View Synthesis Optimization) was adopted to decide the depth coding mode in 3D-HEVC encoder. The WVSO is a metric for better preserving thecoded depth fidelity. Previously, it was shown that coded depth using a metric considering only view synthesis qualities (a.k.a. VSO) had some severe artefacts. With WVSO, a weighted sum of distortions of depth domain and synthesis domain is used to remove those artefacts. However, WVSO has not been applied in intra SDC (Simplified Depth Coding). In this proposal, the metric for SDC is changed from VSO to WVSO. In CTC (Common Test Condition, Random Access), simulation result has BD-rate change video-only : -0.1% , video-total : 0.0%, synth-total : -0.2% compared to HTM-6.0 with 99.6% encoding time, and 104.0% decoding time. In AI (All Intra) , simulation result has BD-rate change video-total : 0.7% and synth-total : -0.2% compared to HTM-6.0 with 94.7% encoding time, and 104.6% decoding time.

# Introduction

WVSO[1] has been used to guarantee both depth fidelity and the synthesis results. WVSO reduced depth coding artefacts compared to VSO since VSO measure distortions on view-synthesis domain.

However, SDC[2] has used VSO as metric for distortion term. It can cause the unfair competition with other coding modes.

In this contribution, WVSO is applied to measure distortion cost for intra SDC.

# Proposed Method

Weighted sum of distortions of depth domain and synthesis domain was calculated to remove those artefacts. The weighting factor is set to same value as other intra modes. The weighting factor is VSO : VSD : Depth\_ItSelf = 10:1:1. The below figure shows depth sample when VSO and WVSO is applied to intra SDC.

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| Original input  (GT\_Fly, Video1) | C:\Users\jiwook.jung\Documents\3DV_Ours\MPEG104\SDCwithWVSO\frame000152_Original.jpg |
| HTM-6.0(SDC with VSO)  (GT\_Fly, Video1)  (All intra, QP30, FrameNum : 152 ) | C:\Users\jiwook.jung\Documents\3DV_Ours\MPEG104\SDCwithWVSO\frame000152_VSO_QP30.jpg |
| HTM-6.0(SDC with WVSO)  (GT\_Fly, Video1)  (All intra, QP30, FrameNum : 152 ) | C:\Users\jiwook.jung\Documents\3DV_Ours\MPEG104\SDCwithWVSO\frame000152_WVSO_QP30.jpg |

Figure1. depth sample with VSO and WVSO metric

# Experimental results

WVSO is integrated to intra SDC mode on HTM-6.0. The below table shows the simulation results under CTC and AI

Table1. results on SDC with WVSO CTC



Depth BD-BR (Depth PSNR – Depth bitrate) : -14.5 ~ -60.8%

Table2. results on SDC with WVSO AI



Depth BD-BR (Depth PSNR – Depth bitrate) : -41.8 ~ -84.6%

# Conclusion

In this contribution, WVSO is integrated to intra SDC mode. WVSO should be applied to for fair competition of mode.

It is recommended that proposed method is adopted into Common Test Condition.

# Reference

1. J. W. Jung, S. Yea, (LG), "3D-CE4.h : 3D-CE4.h Results on Depth distortion metric with a weighted depth fidelity term", Joint Collaborative Team on 3D Video Coding Extension Development (JCT-3V) of ITU-T VCEG and ISO/IEC MPEG JCT3V-B0131, Shanghai, China, October, 2012.
2. Fabian Jäger, (RWTH), " 3D-CE6.h Results on Simplified Depth Coding with an optional Depth Lookup Table", Joint Collaborative Team on 3D Video Coding Extension Development (JCT-3V) of ITU-T VCEG and ISO/IEC MPEG JCT3V-B0036, Shanghai, China, October, 2012.

# Patent rights declaration(s)

**LG electronics does not have any current or pending patent rights relating to the technology described in this contribution.**