INTERNATIONAL ORGANISATION FOR STANDARDISATION
ORGANISATION INTERNATIONALE DE NORMALISATION
ISO/IEC JTC1/SC29/WG11
CODING OF MOVING PICTURES AND AUDIO

ISO/IEC JTC1/SC29/WG11
MPEG2011/M19280
January 2011, Daegu, Korea

Source: GIST (Gwangju Institute of Science and Technology)
Status: Report
Title: MPEG 3DV EE4 Results on Newspaper
Author: Min-Koo Kang, Cheon Lee, and Yo-Sung Ho

1. Introduction

This document reports experimental results of EE4 on 'Newspaper' sequence as a response of N11630 [1]. Two participants, GIST and UPM, conducted the EE4 on 'Newspaper' sequence in the last meeting, and different coding results were reported [2][3]. To avoid the same problem, the two participants have shared common configuration files beforehand to guarantee the same coding conditions for 2-view configuration and 3-view configuration. In this report, we presented four QP sets for each configuration, and each QP set shows the best rendering quality with the target bit rate.

Table 1. Coding conditions

Reference software		JMVC 8.3
GOP size		15
Number of frames		300
Search range		96
View number	2-view	4, 6
	3-view	2, 4, 6

2. 2-view Configuration

We selected the best combinations of QPs for color and depth sequences based on the target bit rates; 0.375, 0.5, 0.75, 1.25 Mbps for ‘Newspaper’. In the case of 2-view configuration, the total bit rate is calculated by

$$\text{Total bit rate} = \text{Rate}(L\_color) + \text{Rate}(R\_color) + \text{Rate}(L\_depth) + \text{Rate}(R\_depth)$$

Table 2 shows the total bit rate and PSNR of synthesized images for the 2-view configuration. We allowed 5% margin for each target bit rates.

The synthesis result for the 5th view was obtained by a decoded pair of color and depth videos at each bit rate, and rendering results are shown in Figure 1.

Table 2. Total bit rates and PSNR of synthesized images for 2-view configuration

Target Bit rate (Mbps)	Color		Depth		Total bit rate (kbps)	PSNR of 5th syn. view (dB)
	QP	Bit rate (kbps)	QP	Bit rate (kbps)		
0.375	42	303.08	46	84.56	387.65	29.42
0.5	39	412.23	44	106.76	519.00	30.50
0.75	35	620.68	41	155.58	776.26	31.50
1.25	31	998.11	36	286.39	1284.49	32.36

Figure 1. Synthesized views of 5th viewpoint at different bit rates.

3. 3-view Configuration

In the case of 3-view configuration, coding experiments are performed based on the target bit rates; 0.5, 0.7, 1.0, 1.35 Mbps for 'Newspaper'. The total bit rate is obtained by

$$\text{Total bit rate} = \text{Rate(L\_color)} + \text{Rate(C\_color)} + \text{Rate(R\_color)} + \text{Rate(L\_depth)} + \text{Rate(C\_depth)} + \text{Rate(R\_depth)}$$

Table 3 describes the total bit rates and the average PSNR of two synthesized views, 3rd and the 5th viewpoints, for 3-view configuration. Similarly to the 2-view configuration, we allowed 5% margin for each target bit rates. The synthesis results for the 3rd viewpoint are obtained by the 2nd and the 4th reconstructed video pairs, and the synthesis results for the 5th are obtained by the 4th and the 6th reconstructed video pairs. Figure 2 shows the rendering results of 3rd and 5th synthesized views at different bit rates, and Figure 3 explains the generation of virtual views for both stereo and 9-view display tests.

Table 3. Total bit rates and PSNR of synthesized images for 3-view configuration

Target Bit rate (Mbps)	Color		Depth		Total bit rate (kbps)	Average PSNR of 4th and 6th syn. views (dB)
	QP	Bit rate (kbps)	QP	Bit rate (kbps)		
0.5	43	425.29	50	102.05	527.34	28.83
0.7	40	564.02	44	166.03	730.05	29.91
1.0	37	783.59	41	239.84	1023.43	30.63
1.35	34	1077.55	39	306.68	1384.24	31.07

Figure 2. Synthesized views of 3rd and 5th viewpoints at different bit rates.

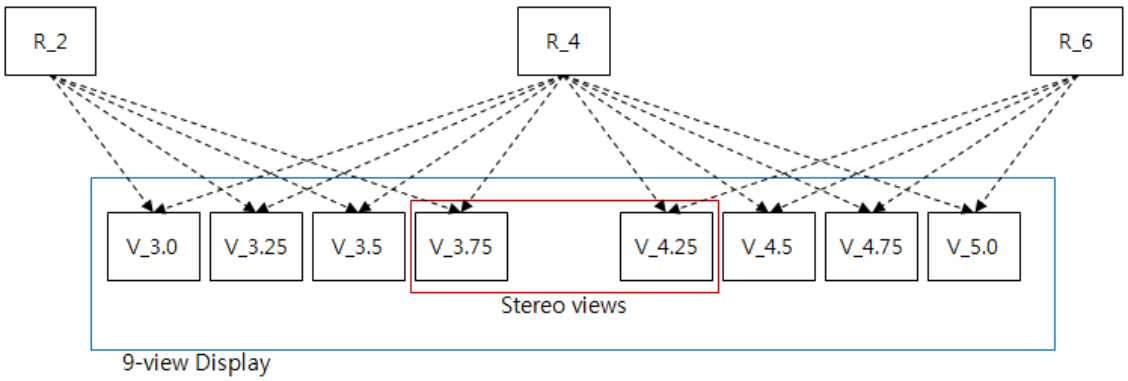

Figure 3. Virtual view generation for stereo and 9-view display tests

4. Conclusion

In this contribution, we have reported EE4 results on 'Newspaper' sequence for the 3D video coding standardization. According to each target bit rate, we have selected proper QP set which shows the best rendering quality in terms of PSNR. The experimental results showed that the quality change is noticeable according to each target bit rate. Therefore, allocated the target bit rates look appropriate for the future 3DVC activities. We are ready to demonstrate the stereo files and multiview files at 95th Daegu meeting.

5. Acknowledgements

This research was supported by the MKE(The Ministry of Knowledge Economy), Korea, under the ITRC(Information Technology Research Center) support program supervised by the NIPA(National IT Industry Promotion Agency (NIPA-2011-(C1090-0902-0017))

6. References

[1] ISO/IEC JTC1/SC29/WG11 "Description of Exploration Experiments in 3D Video Coding," N11630, October 2010.
[2] ISO/IEC JTC1/SC29/WG11 "Results of EE4 on 'Newspaper' Sequence," M18513, October 2010.
[3] ISO/IEC JTC1/SC29/WG11 "Results on 3DVC EE4 for Newspaper," M18363, October 2010.