

REDEFINING MOBILITY



JCT3V-D0188: Simplified adaptive luminance compensation in 3D-AVC

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Introduction

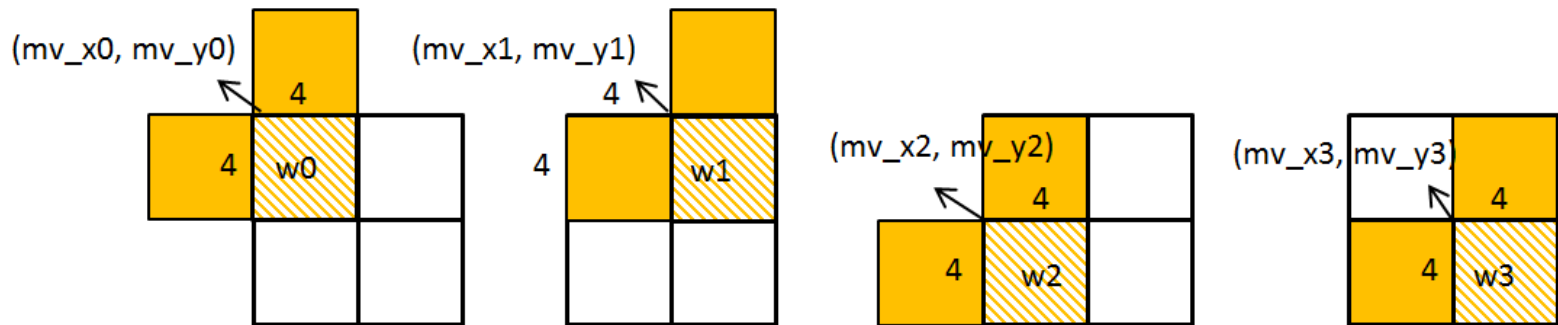
- Adaptive luminance compensation (ALC) in 3D-AVC
 - Compensating the luminance discrepancy in inter-view pictures, and achieving around 2% BD-rate saving in 3D-AVC.
 - Using a set of prediction weights derived with the above and left regions of the current block and the corresponding block in a reference picture (See the figure [1] below)



[1] M. Mishurovskiy, A. Fartukov, I. Kovliga, J. Lee, "3D-CE2.a results on inter-view coding with adaptive luminance compensation," JCT3V-B0031

Weight Prediction Derivation in the current ALC design

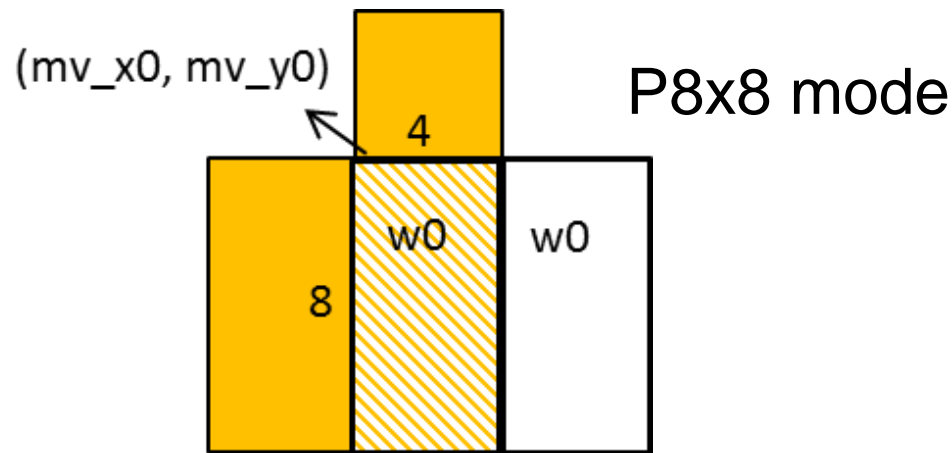
- One time derivation for an MB partition if the MB partition does not contain more than one sub-macroblock (subMB) partition.
- However, if P8x8 contains more than one subMB partition, each of subMB partition needs to derive the weigh prediction.
 - All 4x4 blocks are processed in 8x8 MB partition.



Prediction weight derivation in P8x8 mode having multiple sub-MB partitions.

Proposed Method

- One time prediction weight derivation per MB partition no matter what the MB partition contains multiple subMB partitions, and applied to all the subMB partitions therein.
 - The ALC is conducted with the motion information of the first subMB partition (index 0).



Example of proposed prediction weight derivation in sub-MB partitions

Expected Advantages

- Keep the current design (ALC applied to P_skip, P16x16, P16x8, P8x16, P8x8, and P8x8ref0) while giving a minimal change in a coding gain.
- Complexity reduction
 - Reduction of the worst number of ALC weighted prediction derivation (one time derivation for an MB partition)
 - Enhanced parallel processing (the 4x4 blocks in an 8x8 MB partition do not need to be processed in serial)

Experimental Results

Proposed simplification VS ATM7.0 in CTC

	Texture Coding		Depth Coding		Total (Coded PSNR)		Total (Synthesed PSNR)		Complexity estimate (ratio to anchor)		
	dBR, %	dPSNR,dB	dBR, %	dPSNR,dB	dBR, %	dPSNR,dB	dBR, %	dPSNR,dB	Encoder, %	Decoder, %	Rendering, %
S01	0.03	0.00	0.00	0.00	0.03	0.00	-0.03	0.00	0.96	0.98	#DIV/0!
S02	-0.02	0.00	0.00	0.00	-0.02	0.00	0.00	0.00	0.99	1.01	#DIV/0!
S03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	1.10	#DIV/0!
S04	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	1.00	1.00	#DIV/0!
S05	-0.02	0.00	0.00	0.00	-0.01	0.00	-0.04	0.00	0.99	0.97	#DIV/0!
S06	-0.01	0.00	0.00	0.00	-0.01	0.00	-0.01	0.00	0.96	0.94	#DIV/0!
S08	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.00	0.99	1.01	#DIV/0!
Average	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	1.00	1.00	#DIV/0!

Crosscheck results in JCT3V-D0127

Conclusion

■ Proposed Method

- Simplify the ALC in 3D-AVC, so that an ALC prediction weight is derived once for an MB partition.
- Only minor change in coding efficiency (~ 0.01 BD-rate reduction).

Thank you!

Special thank you Samsung for
cross-checking (JCT3V-D0127)