

REDEFINING MOBILITY



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

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# Introduction

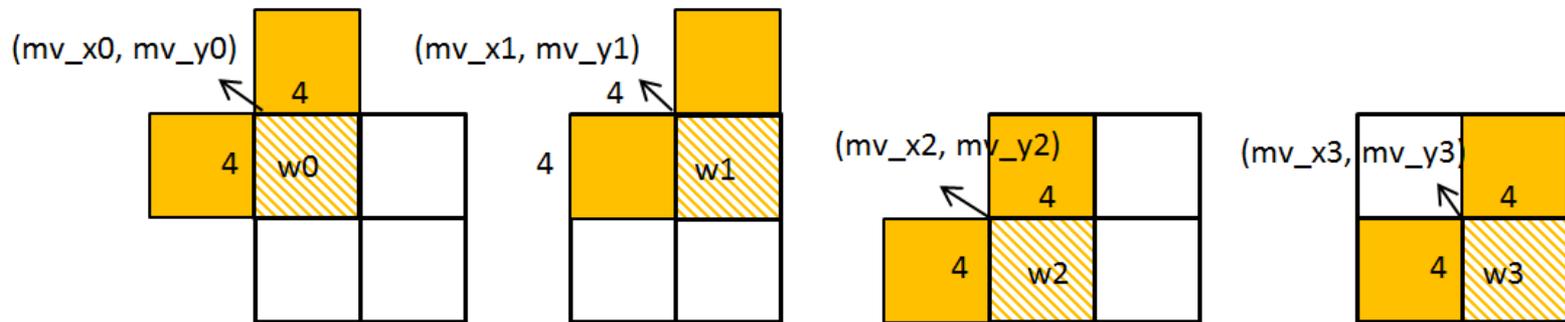
- Adaptive luminance compensation (ALC) in 3D-AVC
  - Compensating the luminance discrepancy in inter-view pictures, and achieving around 2% BD-rate saving in 3D-AVC.
  - Using a set of prediction weights derived with the above and left regions of the current block and the corresponding block in a reference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

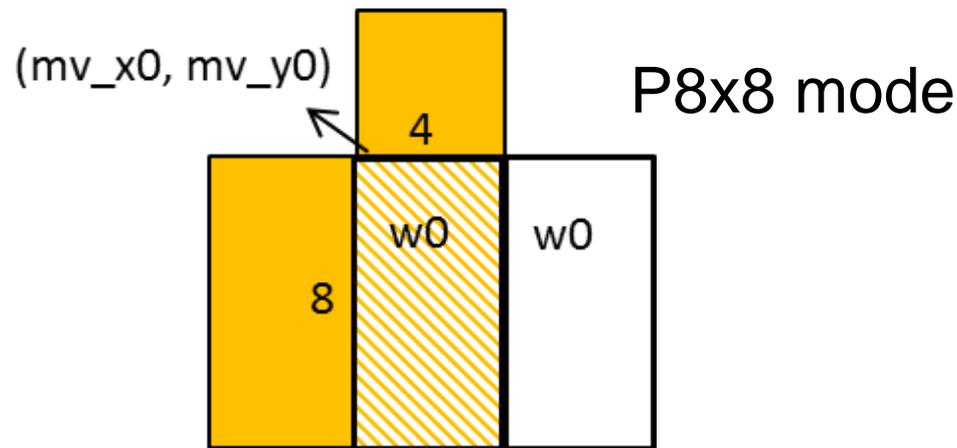
- One time derivation for an MB partition if the MB partition does not contain more than one sub-macroblock (subMB) partition.
- However, if P8x8 contains more than one subMB partition, each of subMB partition needs to derive the weigh prediction.
  - All 4x4 blocks are processed in 8x8 MB partition.



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)