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Non-CE9: On conditions for DMVR and BDOF JVET-N0146

SHARP CORPORATION

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- DMVR and BDOF have an assumption of constant brightness.
- In this contribution, so-called weighted prediction tools do not apply, when DMVR and BDOF apply.
 - If $G_{bIdx}[xCb][yCb]$ is equal to 0, DMVR applies
 - If $luma_weight_l0_flag[refIdxL0]$ and $luma_weight_l1_flag[refIdxL1]$ are equal to 0, DMVR and BDOF apply
- As experimental results, 1% of encoding and decoding times improvements and no loss.

- 3 lines are added

- DMVR

8.5 Decoding process for coding units coded in inter prediction mode

8.5.1 General decoding process for coding units coded in inter prediction mode

- When all of the following conditions are true, dmvrFlag is set equal to 1:
 - sps_dmvr_enabled_flag is equal to 1
 - merge_flag[xCb][yCb] is equal to 1
 - both predFlagL0[0][0] and predFlagL1[0][0] are equal to 1
 - mmvd_flag[xCb][yCb] is equal to 0
 - DiffPicOrderCnt(currPic, RefPicList[0][refIdxL0]) is equal to DiffPicOrderCnt(RefPicList[1][refIdxL1], currPic)
 - Gbidx[xCb][yCb] is equal to 0.
 - luma_weight_l0_flag[refIdxL0] and luma_weight_l1_flag[refIdxL1] are equal to 0
 - cbHeight is greater than or equal to 8
 - cbHeight*cbWidth is greater than or equal to 64

- BDOF

8.7.5 Decoding process for inter blocks

8.7.5.1 General

- If all of the following conditions are true, bdofFlag is set equal to TRUE.
 - sps_bdof_enabled_flag is equal to 1.
 - predFlagL0[xSbIdx][ySbIdx] and predFlagL1[xSbIdx][ySbIdx] are both equal to 1.
 - DiffPicOrderCnt(currPic, RefPicList[0][refIdxL0]) * DiffPicOrderCnt(currPic, RefPicList[1][refIdxL1]) is less than 0.
 - MotionModelIdx[xCb][yCb] is equal to 0.
 - merge_subblock_flag[xCb][yCb] is equal to 0.
 - Gbidx[xCb][yCb] is equal to 0.
 - luma_weight_l0_flag[refIdxL0] and luma_weight_l1_flag[refIdxL1] are equal to 0.
 - cldx is equal to 0.

Otherwise, bdofFlag is set equal to FALSE.

- 1% of encoding and decoding time were improved.
- There was no loss.

	Random Access Main 10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1	0.00%	0.05%	0.06%	99%	99%
Class A2	0.02%	0.10%	0.10%	99%	100%
Class B	-0.01%	0.03%	-0.01%	99%	99%
Class C	0.00%	-0.01%	-0.03%	100%	100%
Class E					
Overall	0.00%	0.04%	0.02%	99%	99%
Class D	0.02%	-0.09%	-0.08%	100%	100%
Class F	-0.10%	-0.07%	-0.08%	99%	100%

- Results of Six companies were matched.

		GBi	WP	POC
JVET-N0153	Ericsson	V		
JVET-N0262	Qualcomm	V		
JVET-N0146	Sharp	V	V	
JVET-N0162	Hikvision	V	V	V
JVET-N0442/N0443	LGE	V	V	V
JVET-N0440	Bytedance	V		V

- GBi: $G_{bidx}[xCb][yCb]$ is equal to 0, when DMVR applies
- WP: $luma_weight_l0_flag[refIdxL0]$ and $luma_weight_l1_flag[refIdxL1]$ are equal to 0, when DMVR and BDOF apply
- POC: $DiffPicOrderCnt(currPic, RefPicList[0][refIdxL0])$ is equal to $DiffPicOrderCnt(RefPicList[1][refIdxL1], currPic)$, when BDOF applies

- In this contribution, we proposed some additional conditions for DMVR and BDOF when weighted prediction tools apply.
- As experimental results, 1% of encoding and decoding were improved and there was no loss.
- Multiple companies propose the same scheme.
- Recommend to fix this change to WD and VTM software.
- Thank Philippe (Technicolor, JVET-N0522) for cross-checking.

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