

NON-CE7: A CLEAN-UP FOR INTER_PRED_IDC CODING (JVET-P0042)



Brian Heng, Minhua Zhou

Broadcom Inc.

Background

- In the the current design of inter_pred_idc coding, the same context model is shared by the coding of the bi_pred_flag for 8x8 CUs and the list1 flag of uni-pred CUs of all sizes, two basically unrelated elements.

Table 9-82 Assignment of ctxInc to syntax elements with context coded bins

Syntax element	binIdx					
	0	1	2	3	4	>= 5
inter_pred_idc[x0][y0]	(cbWidth + cbHeight) > 12 ? 7 - ((1 + Log2(cbWidth) + Log2(cbHei ght)) >> 1) : 4	4	na	na	na	na

Table 9-81 – Binarization for inter_pred_idc

Value of inter_pred_idc	Name of inter_pred_idc	Bin string	
		(cbWidth + cbHeight) > 12	(cbWidth + cbHeight) == 12
0	PRED_L0	00	0
1	PRED_L1	01	1
2	PRED_BI	1	-

Table 1. Five context models used for inter_pred_idc in VTM6.0

0	bi_pred flag for 128x128, 128x64, 64x128
1	bi_pred flag for 64x64, 64x32, 32x64
2	bi_pred flag for 32x32, 32x16, 16x32
3	bi_pred flag for 16x16, 16x8, 8x16
4	bi_pred flag for 8x8 & list0/list1 flag for uni-pred CUs of all sizes

Proposed Changes

- Proposed to add a context model to code list0/list1 flag for uni-pred CUs of all sizes.

Table 9-82 Assignment of ctxInc to syntax elements with context coded bins

Syntax element	binIdx					
	0	1	2	3	4	>= 5
inter_pred_idc[x0][y0]	(cbWidth + cbHeight) > 12 ? 7 - ((1 + Log2(cbWidth) + Log2(cbHeight)) >> 1) : 5	5	na	na	na	na

Table 9-81 – Binarization for inter_pred_idc

Value of inter_pred_idc	Name of inter_pred_idc	Bin string	
		(cbWidth + cbHeight) > 12	(cbWidth + cbHeight) == 12
0	PRED_L0	00	0
1	PRED_L1	01	1
2	PRED_BI	1	-

Table 2. Six context models used for inter_pred_idc in the proposed solution

0	bi_pred flag for 128x128, 128x64, 64x128
1	bi_pred flag for 64x64, 64x32, 32x64
2	bi_pred flag for 32x32, 32x16, 16x32
3	bi_pred flag for 16x16, 16x8, 8x16
4	bi_pred flag for 8x8
5	List0/list1 flag for uni-pred CUs of all sizes

```
const CtxSet ContextSetCfg::InterDir = ContextSetCfg::addCtxSet
({
    { 6, 13, 5, 4, 25, 48, },
    { 7, 6, 5, 4, 33, 34, },
    { CNU, CNU, CNU, CNU, CNU, CNU, },
    { 0, 0, 1, 4, 0, 0, },
});
```

Experimental Results

- The proposed change led to an average BD-rate difference of -0.01% in RA and -0.02% in LD_B, respectively, when compared to the VTM6.0 anchor.

Random Access Main 10					
Over VTM6.0					
	Y	U	V	EncT	DecT
Class A1	-0.01%	-0.04%	-0.05%	100%	92%
Class A2	0.01%	0.00%	0.00%	94%	92%
Class B	-0.02%	0.05%	-0.04%	94%	83%
Class C	-0.02%	0.03%	-0.09%	101%	83%
Class E					
Overall	-0.01%	0.02%	-0.05%	97%	86%
Class D	-0.05%	-0.06%	0.06%	92%	79%
Class F (optional)	-0.01%	-0.01%	-0.01%	97%	89%

Low delay B Main10					
Over VTM6.0					
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	0.00%	-0.10%	-0.15%	94%	99%
Class C	-0.02%	-0.01%	-0.23%	86%	82%
Class E	-0.07%	0.01%	0.38%	85%	79%
Overall	-0.02%	-0.05%	-0.04%	89%	88%
Class D	-0.08%	-0.37%	0.00%	82%	63%
Class F (optional)	0.04%	-0.25%	0.24%	93%	78%

Thanks to Nokia for cross-checking.

Recommendation

- It is recommended to fix the design inconsistency in the inter_pred_idc coding.