



MEDIATEK

TE2-3.1.7: Inter-layer intra prediction signaling with residual skip flag

Tzu-Der (Peter) Chuang, Yu-Wen Huang, Shawmin Lei (MediaTek)

Chulkeun Kim, Joonyoung Park, Byeongmoon Jeon (LG)

Presented by Tzu-Der (Peter) Chuang

12th JCT-VC Meeting in Geneva

14–23 Jan. 2013

Overall Summary

- A syntax coding method and a deblocking modification for inter-layer texture prediction (IntraBL mode)
- IntraBL Mode Signaling
 - An intra_BL_flag is signaled at coding unit (CU) level after the skip_flag
 - A residual skip flag, no_residual_syntax_flag, is used to skip the residual coding for IntraBL mode
- Deblocking modification
 - The boundary strengths (BS) of IntraBL mode coded blocks are set to 1
- DST is used for 4x4 TU in IntraBL mode
- The decoding time is reduced by 5-17% compared with SMuC-0.1.1 anchor

Anchor: HM-8.1 simulcast

| | AI-2x | AI-1.5x | RA-2x | RA-1.5x | LP-2x | LP-1.5x |
|---------|--------|---------|--------|---------|--------|---------|
| BD-rate | -23.2% | -32.9% | -16.6% | -24.6% | -12.4% | -22.1% |

Proposed IntraBL Mode Signaling

- An `intra_BL_flag` is signaled at CU-level after the `skip_flag`

| | Descriptor |
|--|--------------------|
| <code>coding_unit(x0, y0, log2CbSize) {</code> | |
| <code>if(slice_type != I)</code> | |
| <code>skip_flag[x0][y0]</code> | <code>ae(v)</code> |
| <code>if(skip_flag[x0][y0])</code> | |
| <code>prediction_unit(x0, y0, log2CbSize)</code> | |
| <code>else {</code> | |
| <code>intra_BL_flag[x0][y0]</code> | <code>ae(v)</code> |
| <code>if (!intra_BL_flag[x0][y0]) {</code> | |
| <code>pred_mode_flag</code> | <code>ae(v)</code> |
| <code>...</code> | |
| <code>}</code> | |
| <code>}</code> | |
| <code>}</code> | |
| <code>}</code> | |

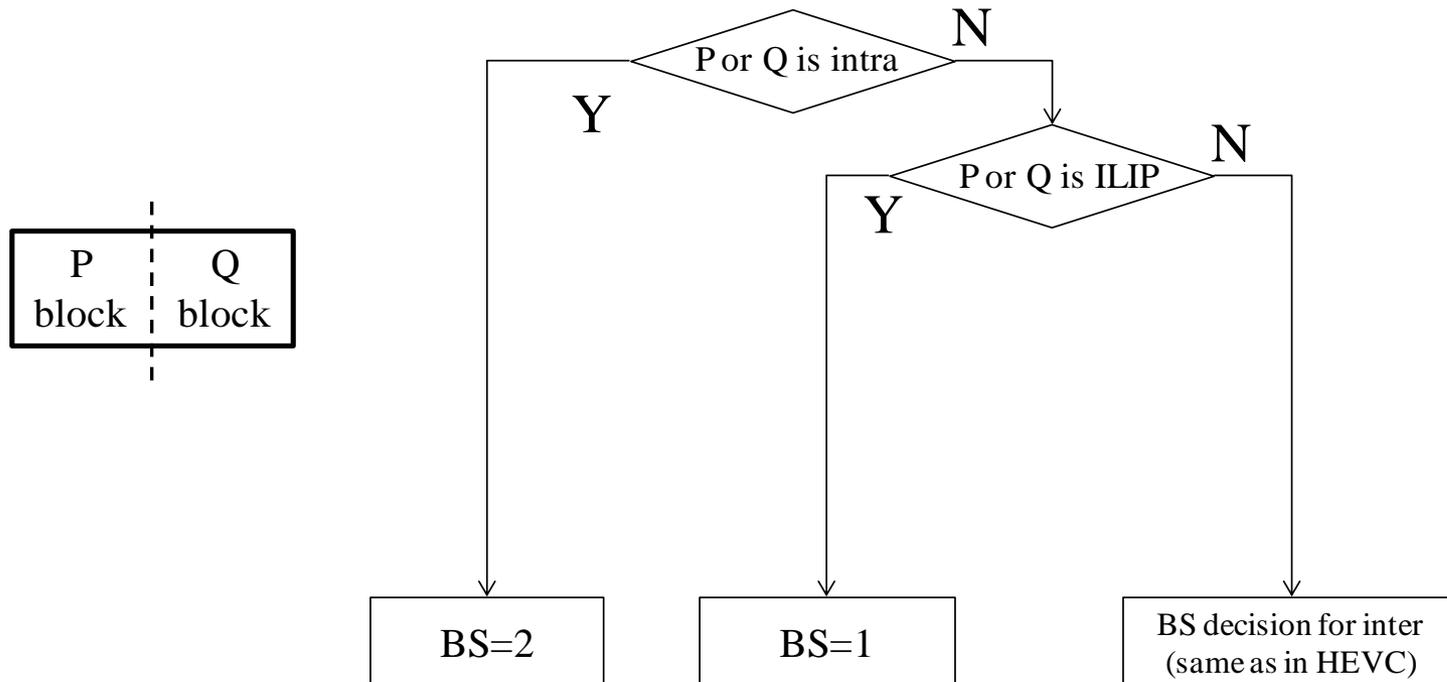
Proposed IntraBL Mode Signaling

- A residual skip flag, `no_residual_syntax_flag`, is used to skip the residual coding for IntraBL mode
 - Reuse the contexts of `no_residual_syntax_flag` in inter-coded block
 - No extra context model or line buffer is required
- DST is used for 4x4 TU in IntraBL mode

| coding_unit(x0, y0, log2CbSize) { | Descriptor |
|---|------------|
| ... | |
| if(!pcm_flag[x0][y0]) { | |
| if(PredMode[x0][y0] != MODE_INTRA && !(PartMode == PART_2Nx2N && merge_flag[x0][y0]) intra_BL_flag[x0][y0]) | |
| no_residual_syntax_flag | ae(v) |
| if(!no_residual_syntax_flag) { | |
| ... | |
| transform_tree(x0, y0 x0, y0, log2CbSize, 0, 0) | |
| ... | |
| } | |

Proposed Deblocking Modification

- If one or two of the adjacent blocks (P or Q) for a boundary is coded as IntraBL mode, the boundary strength is set to 1



Simulation Results

- Anchor: HM-8.1 simulcast
- Thank KDDI for cross-verification (JCTVC-L0387).

| | AI-2x | AI-1.5x | RA-2x | RA-1.5x | LP-2x | LP-1.5x |
|---------|--------|---------|--------|---------|--------|---------|
| BD-rate | -23.2% | -32.9% | -16.6% | -24.6% | -12.4% | -22.1% |

- Anchor: SMuC-0.1.1
- The decoding time is reduced by 5-17% compared with SMuC-0.1.1 anchor

| | AI-2x | AI-1.5x | RA-2x | RA-1.5x | LP-2x | LP-1.5x |
|-----------|-------|---------|-------|---------|-------|---------|
| BD-rate | -0.6% | -0.7% | -0.3% | -0.5% | -0.2% | -0.4% |
| Enc. Time | 99% | 99% | 99% | 99% | 99% | 99% |
| Dec. Time | 87% | 83% | 95% | 91% | 94% | 88% |

Conclusions

- In this contribution, a syntax coding method and a deblocking modification is proposed for IntraBL mode
 - An `intra_BL_flag` is signaled CU-level after the `skip_flag`
 - A `no_residual_syntax_flag` is used to skip the residual coding
 - The BS of IntraBL mode coded blocks are set to 1
- Simulation results reportedly show 12.4-32.9% bit rate reduction compared with HM-8.1 simulcast
- The decoding time is reduced by 5-17% compared with SMuC-0.1.1 anchor