

Extended deblocking-filter decision for large block boundary

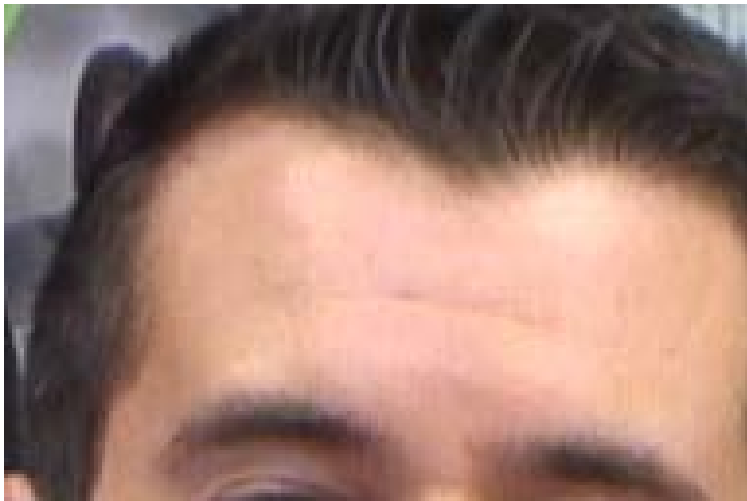
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Overview

- An extension of deblocking filter decision
 - An edge size is larger than 16
 - A filter type is strong
 - One of the block type is intra
 - The subjective degradation in Class E LDB by C0049 is solved.
- An extension of deblocking filter process
 - # of filtered pixels is increased from six to 14
- Recommend to
 - include the proposal to study it in the EEs.
 - conduct a viewing test during the meeting.

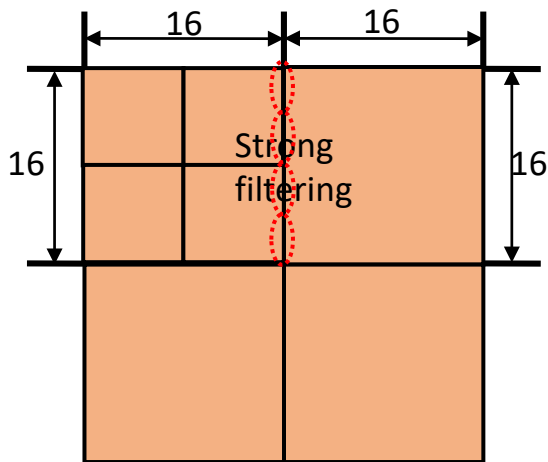
Motivation

- High resolution (4K and 8K) video will be more popular in the future.
 - # of large coding unit will be increased.
- Current deblocking-filter design has small problem
 - A strong filter generates blockiness in LDB condition.
 - Error is temporally accumulated on ends of filtered pixels (p3/q3) in LDB.

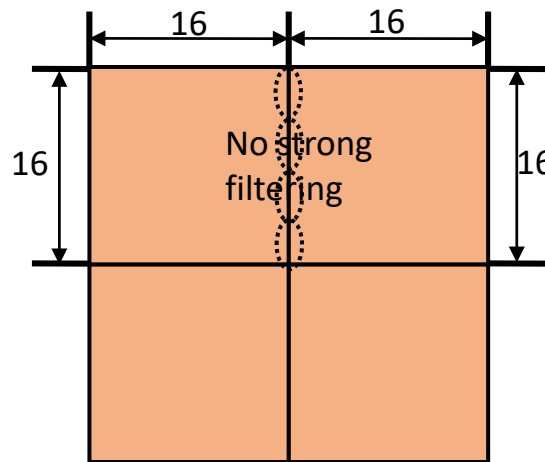


Proposed decision

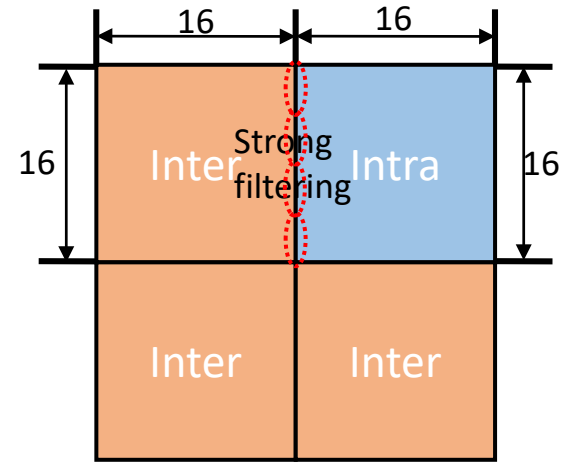
- The following criteria is true, go to next criteria.
 - C1: Boundary is located on 16 or longer CU edge;
 - C2: Strong filtering mode is enabled
- If one of the unit is intra
 - Apply the proposed extended filter
- Otherwise: **no filtering**



Existing filter



Existing filter



Apply

Cont'd Proposal (same as C0049)

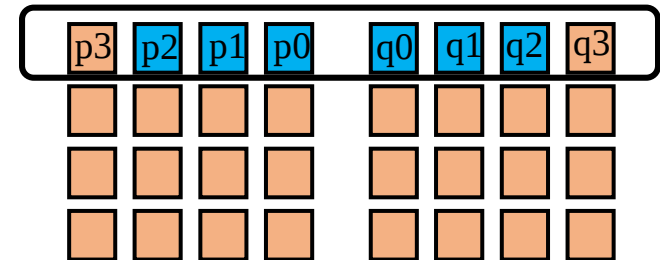
- Extension of the filtered samples on edge filtering

The JEM3.0 filter coefficients of p3-p0 and q0-q3 for p0, p1, and p2 samples are as follows.

$$p2 = 2, 3, 1, 1, 1, 0, 0, 0$$

$$p1 = 0, 2, 2, 2, 2, 2, 0, 0 \quad \text{max 5 taps}$$

$$p0 = 0, 1, 2, 2, 2, 1, 0, 0$$



The proposed filter coefficients of p7-p0, and q0-q7 for p0-p6 samples are as follows.

$$p6 = 3, 5, 2, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0$$

$$p5 = 1, 2, 5, 2, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0$$

$$p4 = 0, 1, 3, 3, 3, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0$$

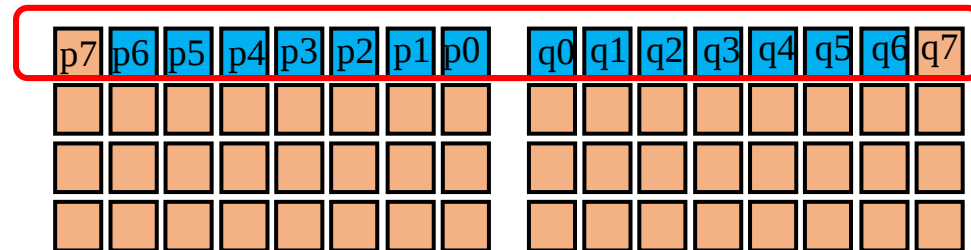
$$p3 = 0, 1, 2, 2, 2, 2, 2, 1, 1, 1, 1, 1, 0, 0, 0$$

$$p2 = 0, 0, 1, 2, 2, 2, 2, 2, 2, 1, 1, 1, 0, 0, 0$$

$$p1 = 0, 0, 1, 1, 2, 2, 2, 2, 2, 2, 1, 1, 0, 0, 0$$

$$p0 = 0, 0, 0, 1, 2, 2, 2, 2, 2, 2, 2, 1, 0, 0, 0$$

max 11 taps

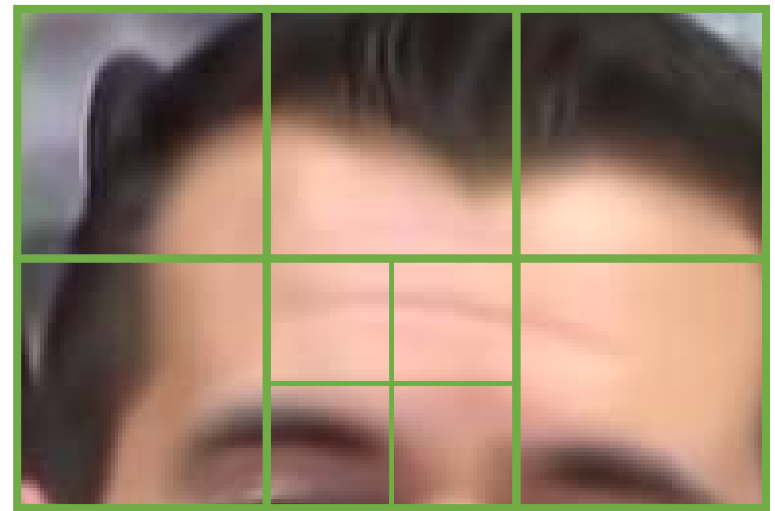


Subjective quality

- The proposed method is implemented to JEM 3.0, and the test condition follows the JVET common test condition.



JEM3.0_D0047



JEM3.0

Experimental results (objective)

- The summary of BD-rate
- Complexity is similar to that by JEM3.0.
 - Decoder running time is 101%.

	All Intra Main10			Random Access Main 10			Low delay B Main10		
	Over JEM3.0			Over JEM3.0			Over JEM3.0		
	Y	U	V	Y	U	V	Y	U	V
Class A1	0.40%	-0.02%	0.00%	0.23%	-0.07%	-0.05%			
Class A2	0.29%	-0.01%	-0.01%	0.19%	-0.02%	0.05%			
Class B	0.23%	0.00%	0.00%	0.15%	0.06%	-0.02%	0.04%	0.07%	-0.01%
Class C	0.12%	0.01%	0.01%	0.05%	0.08%	0.03%	0.06%	-0.01%	-0.02%
Class D	0.09%	0.00%	0.00%	0.02%	0.05%	0.36%	-0.11%	0.31%	-0.54%
Class E	0.19%	0.01%	0.00%				-0.03%	-0.31%	0.02%
Overall	0.22%	0.00%	0.00%	0.13%	0.02%	0.07%	-0.01%	0.04%	-0.14%

Conclusion

- **An extension of deblocking filter decision**
 - An edge size is larger than 16
 - A filter type is strong
 - One of the block type is intra
 - # of filtered pixels is increased from six to 14
- Subjective quality is improved.
- BD loss is small.
- Recommend to
 - include the proposal to study it in the EEs.
 - **conduct viewing during the current or the next meeting.**