

AHG6: Comments on quantization parameter for deblocking filter

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1. Overview

Overview

- Comments on QP of I_PCM block in deblocking filter
 - Case 1: checking of pcm_flag in decision process
 - HM6.0
 - Case 2: No checking of pcm_flag in decision process
 - No coding of QP_Y in I_PCM coding block
 - Coding of QP_Y in I_PCM coding block

2. Comments on Case 1 (HM6.0)

Case 1: checking of pcm_flag in decision process

Case 1 (HM6.0): checking of pcm_flag in decision process

- HM6.0 implementation

- pcm_flag is checked in decision process for deblocking filter.

If pcm_flag of the prediction unit containing sample p0 is equal to 1,
QP_P is set equal to 0.

If pcm_flag of the prediction unit containing sample q0 is equal to 1,
QP_Q is set equal to 0.

A variable qP_L is derived as follows:

$$qP_L = ((QP_P + QP_Q + 1) \gg 1)$$

Case 1 (HM6.0): checking of pcm_flag in decision process

- Issue in HM6.0

- The minimum value of QP_Y is not always equal to 0.

However, QP_P and QP_Q is always set equal to 0 if pcm_flag of the prediction unit containing sample p0 and q0 are equal to 1, respectively.

- Suggestions in HM6.0

- If pcm_flag is equal to 1, QP_Y (QP_P , QP_Q) should be set equal to -QpBdOffsetY instead of 0. (Scheme 4 of AHG6)

3. Comments on Case 2

no checking of pcm_flag in decision process

- No coding of QP_Y for I_PCM
- Coding of QP_Y for I_PCM

Case 2:

no checking of pcm_flag in decision process

- In the case that QP_Y is not coded for I_PCM coding block,
(Scheme 1 of AHG6)
 - If $\log_2 \text{CbSize}$ is equal or greater than $\log_2 \text{MinCUDQPSize}$, QPY is always equal to predictive QP_Y in I_PCM coding block.
 - If $\log_2 \text{CbSize}$ is less than $\log_2 \text{MinCUDQPSize}$, QPY is not always equal to predictive QP_Y in I_PCM coding block because QPY may be coded in the other non-I_PCM coding block.

Case 2:

no checking of pcm_flag in decision process

- In the case that QP_Y is coded for I_PCM coding block,
(The superset of Scheme 2 of AHG6)
 - If $\log_2 \text{CbSize}$ is equal or greater than $\log_2 \text{MinCUDQPSize}$, QP_Y is always coded in I_PCM coding block.
 - If $\log_2 \text{CbSize}$ is less than $\log_2 \text{MinCUDQPSize}$, QP_Y may be coded in I_PCM coding block. However, QP_Y may be coded in the other non-I_PCM coding block in the same CUQG.

Case 2:

no checking of pcm_flag in decision process

- Issues in Case 2

- In the case that QP_Y is not coded for I_PCM coding block,
 - When pcm_loop_filter_disable_flag value is equal to 1, strong filter is apt to be applied in I_PCM block because I_PCM coding block is coded as intra prediction mode.
- In the case that QP_Y is coded for I_PCM coding block,
 - Syntax needs to be changed.
It seems complicated, especially when $\log_2 \text{CbSize}$ is less than $\log_2 \text{MinCUDQPSize}$.

Case 2:

no checking of pcm_flag in decision process

- Suggestions in Case 2
 - The deblocking filter processes on the reconstructed pixels of I_PCM blocks should be disabled in the case of QP_Y , β_offset_div2 or tc_offset_div2 is great value.
 - QP_Y does not need to be not always coded for I_PCM coding block, especially when $\log2CbSize$ is less than $\log2MinCUDQPSize$, QP_Y should not be coded in terms of complexity.



4. Suggestion

Suggestion

The suggestions are as follows.

- In the case that pcm_flag is checked in decision process,
 - If pcm_flag is equal to 1, QP_Y should be set equal to $-QpBdOffsetY$ instead of 0.
- In the case that pcm_flag is not checked in decision process,
 - The deblocking filter processes on the reconstructed pixels of I_PCM blocks should be disabled in the case of QP_Y , beta_offset_div2 or tc_offset_div2 is great value.
 - QP_Y does not need to be not always coded for I_PCM coding block, especially when log2CbSize is less than log2MinCUDQPSize, QP_Y should not be coded in terms of complexity.

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