

JCTVC-M0120

**On signaling the syntax of
'sps_inter_layer_mfm_enable_flag'**

Hahyun Lee, Jung Won Kang, Jinho Lee, Jin Soo Choi

Introduction

❑ Motion field mapping

- ❖ At the previous meeting, motion field mapping was adopted in reference index based SHVC.
- ❖ In reference index based SHVC, inter-layer motion parameter prediction can be enabled by
 - performing motion field mapping process between the current layer and its reference layer
 - setting the inter-layer reference picture as the collocated picture for TMVP derivation
- ❖ The syntax ‘**sps_inter_layer_mfm_enable_flag**’ in SPS extension is used to indicate whether the motion field mapping process is applied or not.

sps_extension() {	Descriptor
sps_inter_layer_mfm_enable_flag	u(1)
}	

❑ Proposals

- ❖ Signal the syntax ‘sps_inter_layer_mfm_enable_flag’ depending on the syntax ‘sps_temporal_mvp_enabled_flag’
- ❖ Constrain the collocated picture for TMVP derivation for reducing memory requirement

Proposals

□ Proposal 1

- ❖ When TMVP is disabled, the motion field mapping process is unnecessary so that 'sps_inter_layer_mfm_enable_flag' usually be set to 0.

- In such case, 'sps_inter_layer_mfm_enable_flag' should not be signaled.

- ❖ Propose to change the signal of syntax 'sps_inter_layer_mfm_enable_flag' as follows

- When TMVP is enabled, the syntax 'sps_inter_layer_mfm_enable_flag' is signaled

sps_extension() {	Descriptor
if (sps_temporal_mvp_enabled_flag)	
sps_inter_layer_mfm_enable_flag	u(1)
}	

- Add constraint on semantic of 'sps_inter_layer_mfm_enable_flag'
 - When sps_inter_layer_mfm_enable_flag is equal to 0, the inter-layer reference picture shall not be specified as collocated picture for TMVP derivation.
 - Put the notes on semantic of 'collocated_ref_idx'
 - NOTE- when 'sps_inter_layer_mfm_flag' in the SPS extension is equal to 0, the picture referred to by collocated_ref_idx shall not be inter-layer reference picture.

Proposals

□ Proposal 2

- ❖ When 'sps_inter_layer_mfm_enable_flag' is equal to 1, there are two kinds of the collocated picture for TMVP derivation
 - Reference pictures with the same layer index as the current picture (i.e. temporal reference pictures)
 - Inter-layer reference picture
- ❖ Therefore, in addition to motion information of inter-layer reference picture, the motion information of temporal reference pictures always has to be stored.
 - In SHM1.0 RefIdx CTC, 'sps_inter_layer_mfm_enable_flag' is equal to 1 and inter-layer picture is always used as collocated picture for TMVP derivation by encoder control. → motion parameters of temporal reference picture are not used.
- ❖ Propose to constrain the collocated picture for TMVP derivation to be inter-layer reference picture for reducing the memory requirement for storing motion parameter information of reference pictures

Proposals

□ Proposal 2

❖ Approach 1

- Add constrain on the semantic of ‘sps_inter_layer_mfm_enable_flag’.
- When sps_inter_layer_mfm_enable_flag is equal to 1, the only inter-layer reference picture can be used as collocated picture for TMVP derivation, As a results, the motion information of temporal reference pictures are no longer stored.

sps_extension() {	Descriptor
if(sps_temporal_mvp_enabled_flag)	
sps_inter_layer_mfm_enable_flag	u(1)
}	

sps_inter_layer_mfm_enable_flag equal to 1 specifies the motion field mapping process is applied as part of the resampling process for reference pictures specified in subclause G.8.1.2.

sps_inter_layer_mfm_enable_flag equal to 0 specifies that the motion field mapping processing is not applied. When not present, the value of sps_inter_layer_mfm_enable_flag is inferred to be equal to 0. When avc_base_layer_flag is equal to 1, sps_inter_layer_mfm_enable_flag shall be equal to 0. When sps_inter_layer_mfm_enable_flag is equal to 0, the inter-layer reference picture shall not be specified as collocated picture for TMVP derivation. When sps_inter_layer_mfm_enable_flag is equal to 1, only inter-layer reference pictures shall be used as collocated picture for TMVP derivation.

Proposals

□ Proposal 2

❖ Approach 2

- Add a flag in SPS extension to constrain the collocated picture for TMVP, when motion field mapping is enabled as follows.
 - When `sps_temporal_mvp_constraint_flag` is equal to 1
 - the only inter-layer reference picture can be used as collocated picture for TMVP derivation.
 - When `sps_temporal_mvp_constraint_flag` is equal to 0
 - both temporal reference pictures and the inter-layer reference pictures can be used as the collocated picture for TMVP derivation.

sps_extension() {	Descriptor
if (sps_temporal_mvp_enabled_flag) {	
sps_inter_layer_mfm_enable_flag	u(1)
if (sps_inter_layer_mfm_enable_flag)	
sps_temporal_mvp_constraint_flag	u(1)
}	
}	

sps_temporal_mvp_constraint_flag equal to 1 specifies that collocated picture for TMVP derivation is constrained in the CVS. When `sps_temporal_mvp_constraint_flag` is equal to 1, only inter-layer reference pictures shall be used as the collocated picture for TMVP derivation.

When `sps_temporal_mvp_constraint_flag` is equal to 0, both reference pictures with the same layer index as the current picture and the inter-layer reference pictures can be used as the collocated picture for TMVP derivation. When `sps_temporal_mvp_constraint_flag` is not present, it is inferred to be equal to 0.

Conclusion

1. Signal the syntax 'sps_inter_layer_mfm_enable_flag' depending on the syntax 'sps_temporal_mvp_enabled_flag'
 - When TMVP is enabled, signal the syntax 'sps_inter_layer_mfm_enable_flag'
2. **Constrain collocated picture for TMVP derivation to be inter-layer reference picture for reducing the memory requirement of storing motion information of reference pictures.**