

# JVET-P0151

## CE4-related: Simplification of half-pel switchable interpolation filter

### Authors:

Yu-Ling Hsiao, Chun-Chia Chen, Chih-Wei Hsu,  
Yu-Wen Huang, Shaw-Min Lei

Presenter: Yu-Ling Hsiao

# Overall Summary

- Simplify the half-pel switchable interpolation filter (SIF)
  - Method 1: Always set half sample interpolation filter index for pairwise merging candidate to 0
  - Method 2: Always select 8-tap interpolation filter in the final MC of DMVR

Over VTM-6.0 (%)			Y	U	V	EncT	DecT
1	Method 1	RA	0.00	0.07	0.00	100%	100%
		LB	-0.01	0.11	0.03	100%	99%
2	Method 2	RA	0.00	0.02	0.03	101%	100%
		LB	0.00	0.00	0.00	101%	99%
3	Method 1 and Method 2	RA	0.00	0.08	0.00	101%	100%
		LB	-0.01	0.11	0.03	101%	99%

# Proposed Methods

- Method 1: Always set half sample interpolation filter index for pairwise merging candidate to 0
  - Unify between BCW index and half sample interpolation filter index for pairwise merging candidate, both set to default
  - Align with temporal and zero motion vector merging candidates
  - Simplify VVC draft
- Method 2: Always select 8-tap interpolation filter in the final MC of DMVR
  - No switching between 8-tap and 6-tap interpolation filter
  - Following CU still could inherit the half sample interpolation filter index from this CU

# Simulation Results (1/3)

- Method 1: Always set half sample interpolation filter index for pairwise merging candidate to 0

	Random access Main10				
	Over VTM-6.0			EncT	DecT
	Y	U	V		
Class A1	0.02%	0.14%	-0.04%	100%	100%
Class A2	0.03%	0.08%	0.06%	100%	100%
Class B	-0.01%	0.07%	-0.01%	100%	100%
Class C	-0.01%	0.00%	-0.01%	100%	100%
Class E					
<b>Overall</b>	0.00%	0.07%	0.00%	100%	100%
Class D	0.00%	0.10%	0.10%	100%	100%
Class F	0.00%	-0.01%	0.00%	100%	99%

	Low delay B Main10				
	Over VTM-6.0			EncT	DecT
	Y	U	V		
Class A1					
Class A2					
Class B	-0.01%	0.08%	-0.07%	100%	99%
Class C	-0.04%	0.05%	-0.03%	100%	98%
Class E	0.04%	0.25%	0.29%	101%	98%
<b>Overall</b>	-0.01%	0.11%	0.03%	100%	99%
Class D	-0.03%	0.01%	-0.01%	100%	99%
Class F	0.05%	0.13%	0.44%	101%	99%

## Simulation Results (2/3)

- Method 2: Always select 8-tap interpolation filter in the final MC of DMVR

	Random access Main10				
	Over VTM-6.0			EncT	DecT
	Y	U	V		
Class A1	0.00%	-0.01%	0.07%	101%	100%
Class A2	0.01%	0.02%	0.05%	101%	100%
Class B	0.01%	0.05%	0.01%	101%	100%
Class C	-0.01%	0.01%	0.03%	101%	100%
Class E					
<b>Overall</b>	0.00%	0.02%	0.03%	101%	100%
Class D	-0.01%	-0.01%	0.06%	101%	99%
Class F	0.00%	0.02%	0.00%	100%	100%

	Low delay B Main10				
	Over VTM-6.0			EncT	DecT
	Y	U	V		
Class A1					
Class A2					
Class B	0.00%	0.00%	0.00%	101%	99%
Class C	0.00%	0.00%	0.00%	101%	99%
Class E	0.00%	0.00%	0.00%	100%	98%
<b>Overall</b>	0.00%	0.00%	0.00%	101%	99%
Class D	0.00%	0.00%	0.00%	101%	99%
Class F	0.00%	0.00%	0.00%	101%	99%

# Simulation Results (3/3)

- Methods 1 and 2

	Random access Main10				
	Over VTM-6.0			EncT	DecT
	Y	U	V		
Class A1	0.02%	0.09%	-0.03%	101%	100%
Class A2	0.03%	0.10%	0.05%	101%	100%
Class B	0.00%	0.07%	0.00%	101%	100%
Class C	-0.02%	0.05%	-0.02%	101%	101%
Class E					
<b>Overall</b>	0.00%	0.08%	0.00%	101%	100%
Class D	-0.01%	0.02%	0.10%	101%	100%
Class F	0.00%	0.01%	0.00%	100%	100%

	Low delay B Main10				
	Over VTM-6.0			EncT	DecT
	Y	U	V		
Class A1					
Class A2					
Class B	-0.01%	0.08%	-0.07%	101%	99%
Class C	-0.04%	0.05%	-0.03%	101%	99%
Class E	0.04%	0.25%	0.29%	101%	98%
<b>Overall</b>	-0.01%	0.11%	0.03%	101%	99%
Class D	-0.03%	0.01%	-0.01%	101%	99%
Class F	0.05%	0.13%	0.44%	101%	99%

# Conclusions

- Two methods are proposed to simplify the SIF
  - Method 1: Set the half sample interpolation filter index to 0 for pairwise merging candidate
  - Method 2: Always apply the 8-tap interpolation filter for the final MC in DMVR
- Coding efficiency impact is minor
- Thanks to Huawei for cross-checking