

JVET-L0291
**CE3-Related : Extended reference sample construction
for longer interpolation filter in intra prediction**

Sunmi Yoo, Jin Heo, Jangwon Choi, Ling Li and Jaehyun Lim

LG Electronics Inc.

Summary

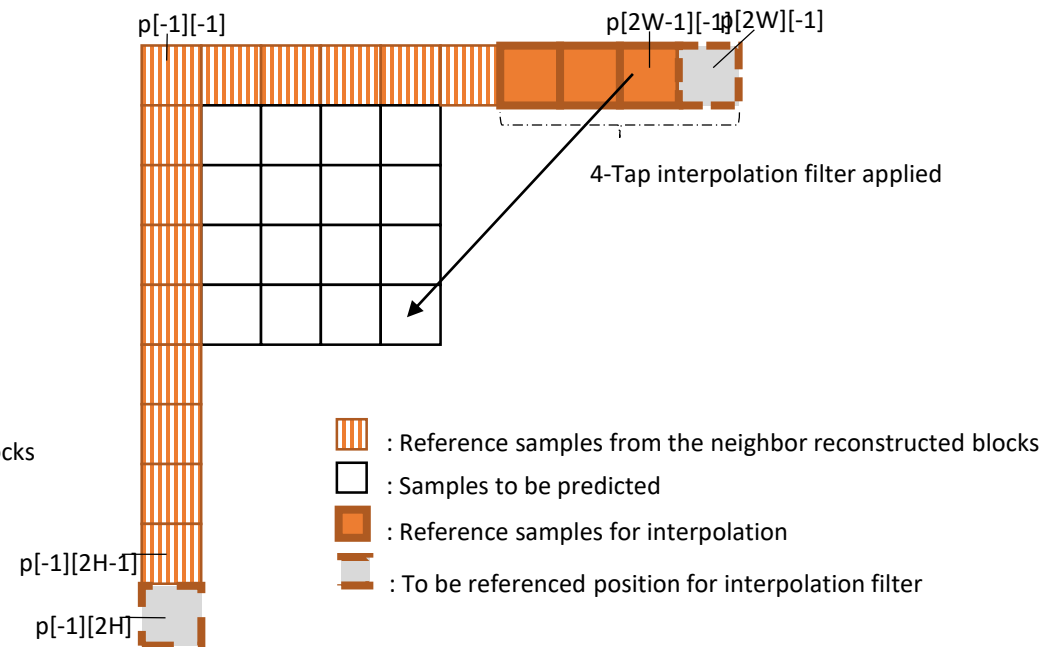
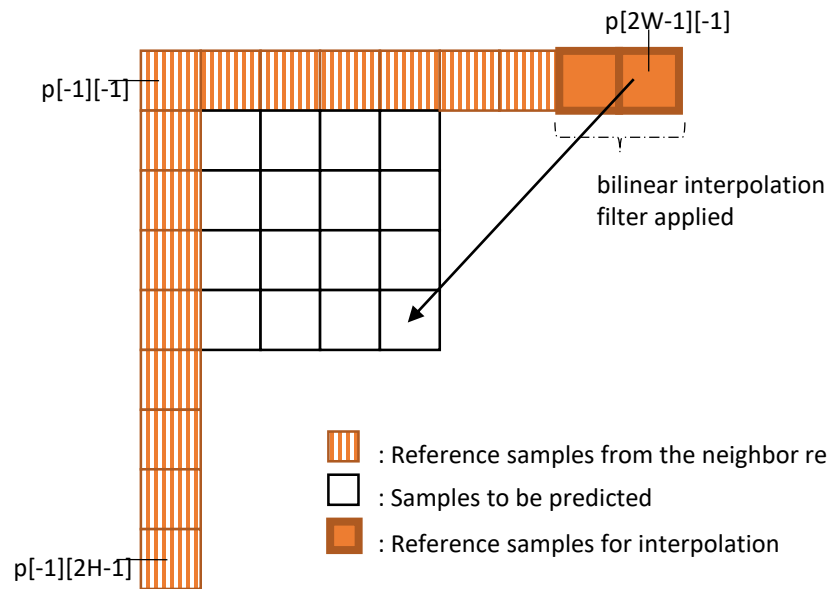
- Purpose
 - To use available reconstructed samples as many as possible for intra prediction

- Proposed schemes
 - Extension of the reference samples according to the interpolation filter size

- Simulation results (Based on VTM-2.0.1)
 - #Test1
 - Y : -0.40%, U : -0.44%, V : -0.43% in AI
 - Y : -0.17%, U : -0.14%, V : -0.08% in RA
 - #Test2 (Based on VTM-2.0.1 with Intra4Tap=1)
 - Y : -0.04%, U : -0.06%, V : -0.02% in AI
 - Y : -0.01%, U : 0.17%, V : 0.22% in RA

Problem statement

- More reference samples are necessary for longer interpolation filter
 - The reference sample size of $2W+1$ or $2H+1$ is not sufficient for longer interpolation filter than bi-linear filters

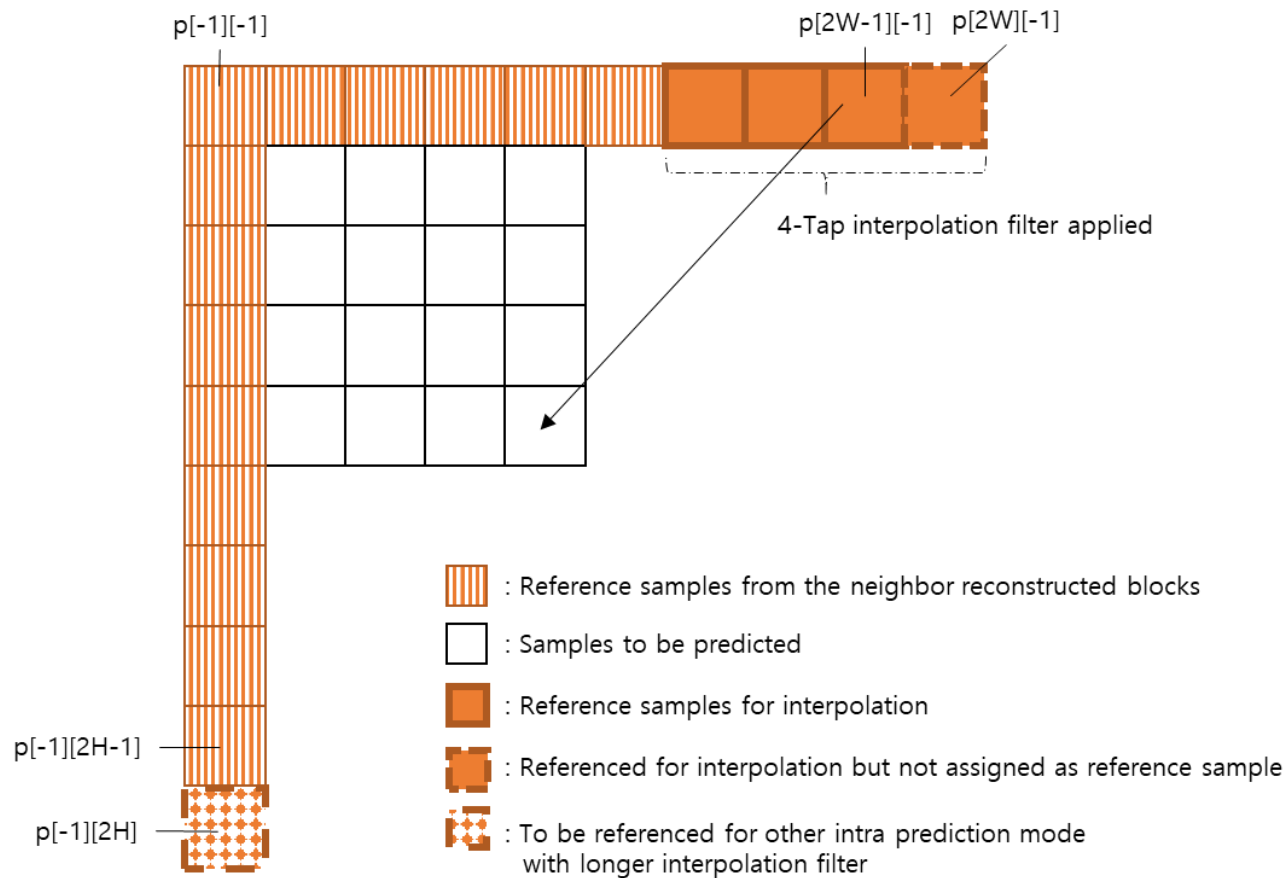


Proposed method

- To have more reconstructed samples as reference samples if available

$$Size_{ref(above)} = Size_{ref(above)} + (filtSize \gg 1) - 1$$

$$Size_{ref(left)} = Size_{ref(left)} + (filtSize \gg 1) - 1$$



Test results

- Based on VTM-2.0.1

	All Intra Main10 – VTM configuration					
	Over VTM-2.0.1 AI			Over VTM-2.0.1 RA		
	Y	U	V	Y	U	V
Class A1	-0.18%	-0.18%	-0.16%	-0.13%	-0.19%	-0.08%
Class A2	-0.14%	-0.03%	-0.12%	-0.07%	-0.01%	-0.04%
Class B	-0.40%	-0.42%	-0.36%	-0.20%	-0.15%	-0.03%
Class C	-0.64%	-0.82%	-0.78%	-0.26%	-0.19%	-0.18%
Class E	-0.57%	-0.66%	-0.69%			
Overall	-0.40%	-0.44%	-0.43%	-0.17%	-0.14%	-0.08%
Class D	-0.52%	-0.39%	-0.60%	-0.27%	-0.40%	-0.16%
Enc Time [%]	102%			102%		
Dec Time [%]	101%			104%		

- Based on VTM-2.0.1 with Intra4Tap=1 (enabled 4-tap intra interpolation filter in VTM)

	All Intra Main10 – VTM configuration					
	Over VTM-2.0.1 AI Intra4Tap=1			Over VTM-2.0.1 RA Intra4Tap=1		
	Y	U	V	Y	U	V
Class A1	-0.02%	-0.11%	-0.11%	0.02%	0.05%	0.07%
Class A2	0.00%	0.12%	0.05%	0.01%	0.29%	0.22%
Class B	-0.04%	-0.03%	0.00%	-0.04%	0.18%	0.22%
Class C	-0.08%	0.03%	0.04%	-0.01%	0.15%	0.35%
Class E	-0.08%	-0.34%	-0.15%			
Overall	-0.04%	-0.06%	-0.02%	-0.01%	0.17%	0.22%
Class D	-0.01%	0.06%	0.02%	-0.03%	0.27%	0.05%
Enc Time [%]	100%			100%		
Dec Time [%]	100%			100%		

Thank you