REDEFINING MOBILITY

JCTVC-F585
Luma/chroma interpolation precision

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Algorithm

- There is only one intermediate stage in the current HM/WD interpolation process where the data precision range exceeds 16-bit
  - After the first stage filtering of 2D filtering (unipred or bipred)
    - 10-bit BitDepth Luma: [-24552, 90024] {-1,4,-11,40,40,-11,4,-1}
    - 10-bit BitDepth Chroma: [-9207, 74679] {-4,27,46,-5}
  - Right shift by 1 of the filtered values after this stage brings the data range to 16-bit, use of a non-normative offset (1<<14) brings the values to 16-bit
  - Reduce the amount of right shift after the second stage by 1
- Proposed change (HE case only, no change for LC)
  - 2D unipred: (Vertical filtering + 1) >> 1,

    (Horizontal filtering +~~2048~~1024) >> ~~12~~11
  - 2D bipred: (Vertical filtering + 1) >> 1,

    (Horizontal filtering + ~~128~~64) >> ~~8~~7

Results (HM3.0 Anchor)

	Random Access HE			Random Access LC		
	Y	U	V	Y	U	V
Class A	0.0	0.0	-0.3	0.0	0.0	0.0
Class B	0.0	0.0	0.0	0.0	0.0	0.0
Class C	0.0	0.0	0.0	0.0	0.0	0.0
Class D	0.0	0.0	0.0	0.0	0.0	0.0
Class E						
Overall	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Enc Time[%]	99%			99%		
Dec Time[%]	89%			105%		

	Low delay B HE			Low delay B LC		
	Y	U	V	Y	U	V
Class A						
Class B	0.0	0.3	0.2	0.0	0.0	0.0
Class C	0.0	-0.1	0.0	0.0	0.0	0.0
Class D	0.0	0.1	0.3	0.0	0.0	0.0
Class E	0.1	0.4	0.0	0.0	0.0	0.0
Overall	**0.0**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**
Enc Time[%]	99%			98%		
Dec Time[%]	89%			108%		

	Low delay P HE			Low delay P LC		
	Y	U	V	Y	U	V
Class A						
Class B	0.0	0.1	0.1	0.0	0.0	0.0
Class C	0.0	0.0	0.0	0.0	0.0	0.0
Class D	0.0	-0.5	-0.2	0.0	0.0	0.0
Class E	0.0	0.1	-0.2	0.0	0.0	0.0
Overall	**0.0**	**-0.1**	**-0.1**	**0.0**	**0.0**	**0.0**
Enc Time[%]	100%			99%		
Dec Time[%]	85%			97%		

- Recommend for adoption