

JVET-P0739

CE5-related: Combination of CCALF methods in JVET-P0165, JVET-P0556, and JVET-P0557

Authors: O. Chubach, C.-Y. Lai, C.-Y. Chen, T.-D. Chuang, Y.-W. Huang, S.-M. Lei (MediaTek), N. Hu, J. Dong, V. Seregin, M. Karczewicz (Qualcomm)

Presenter: Chen-Yen (Jenny) Lai

Overall Summary

- Background: CE5-2.1 CCALF increases complexity significantly (e.g., 46.7% increase in multiplications compared to VTM6.0 ALF)
- Two combined tests of CCALF simplifications
 - [Combination 1]
JVET-P0165 Method 1+2a + JVET-P0556 + JVET-P0557 Method 2
 - [Combination 2]
JVET-P0165 Method 1+2a + JVET-P0556 + JVET-P0557 Method 3
- Worst case # of ALF operations reduced to exactly the same as that of VTM6.0 ALF

	RA YCbCr BD-rate	Preserved coding gain of CE5-2.1 CCALF
CE5-2.1	-0.85%	-
Combination 1	-0.64%	75.7%
Combination 2	-0.64%	75.4%

Introduction

- In JVET-P0165:
 - Method 1: Select CCALF, chroma ALF, or ALF-off for each chroma CTB, and explicitly signal the selection
 - Method 2a: Align the filter shape between CCALF and chroma ALF (13 coefficients)
- In JVET-P0556:
 - Remove the temporal buffers for CCALF coefficients signalling
- In JVET-P0557:
 - Restrictions for CCALF coefficients are proposed
 - Different methods to signal the absolute values of the filter coefficients are applied (Method 2: First order exponential-Golomb (EG1) codes; Method 3: Fixed length codes of 3 bits)

RA Simulation Results

	YCbCr	Y	Cb	Cr
CE5-2.1 CCALF	-0.85%	-1.16%	0.24%	0.59%
Combination 1	-0.64%	-1.19%	1.53%	1.59%
Combination 2	-0.64%	-1.18%	1.50%	1.57%

Worst case # of ALF operations reduced to exactly the same as that of VTM6.0 ALF while 75% of CE5-2.1 CCALF coding gain is kept.

Thanks to Bytedance for crosschecking