

JVET-K0103

CE4-related:

Simplified Affine Prediction

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Problems of affine prediction in BMS-1.0

- ❑ The size of sub-block is not fixed to be 4×4, but derived for each affine-coded CU

- ❑ Suppose $W \times H$ is the size of the current block, the sub-block size $w \times h$ is derived as

$$\begin{cases} w = \max \left\{ 1, \frac{W}{\max(|mv_1^h - mv_0^h|, |mv_1^v - mv_0^v|)} \right\} \\ h = \max \left\{ 1, \frac{H}{\max(|mv_2^h - mv_0^h|, |mv_2^v - mv_0^v|)} \right\} \end{cases}$$

- ❑ w and h are then adjusted to be a divisor of W and H , and set to be 4 at least
 - ❑ This derivation process is complex, but it cannot lower the bandwidth in the worst case
- ❑ Constrains on the usage of affine prediction for merge mode and AMVP mode are different
 - ❑ For the merge mode, affine prediction is applicable for a block with $W \times H \geq 64$,
 - ❑ For the AMVP mode, it is applicable for a block with $W > 8 \ \&\& \ H > 8$
- ❑ The minimum size of sub-block is 2×2 for chroma-components

Proposed

- ❑ The size of sub-block is fixed to be 4×4 for all affine-coded CUs
- ❑ Constrains on the usage of affine prediction for merge mode and AMVP mode are unified
 - ❑ For both merge and AMVP mode, affine prediction is applicable for a block with $W \geq 8 \ \&\& \ H \geq 8$
 - ❑ To avoid unnecessary affine ME for small blocks, affine AMVP mode is skipped at encoder for a block with $W == 8 \ || \ H == 8$, if its parent block is not affine-coded
- ❑ The minimum sub-block size of chroma-components is set to be 4×4 .
 - ❑ Based on the simplification #2, W or H for chroma components is 4 at least.

Experimental Results

RA, Anchor: BMS-1.1

	Y	U	V	Enc	Dec
#1	0.00%	-0.02%	-0.05%	100%	100%
#1+#2	0.02%	-0.01%	-0.02%	100%	101%
#1+#2+#3	0.03%	0.14%	0.19%	99%	96%

RA, Anchor: BMS-1.1, Affine Only

	Y	U	V	Enc	Dec
#1	-0.01%	-0.03%	0.01%	100%	101%
#1+#2	0.02%	-0.02%	0.02%	102%	101%
#1+#2+#3	0.04%	0.20%	0.28%	101%	93%

Summary

- ❑ Three simplifications are proposed for affine prediction in BMS
 - ❑ Sub-block is fixed to be 4×4
 - ❑ Unify constraints for affine
 - ❑ Sub-block size is 4×4 for chroma components
- ❑ Very minor coding performance change
- ❑ Suggest to be adopted into BMS