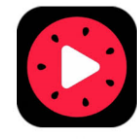


JVET-AE0176

EE2-related: Enhancements on CCRM

Zhipin Deng, Kai Zhang, Li Zhang
ByteDance Inc.



Proposal

- In EE2-3.1, CCRM has been investigated and it provides promising coding gains
 - Chroma of an inter/IBC block is predicted from reconstructed luma through a CCRM model
 - The CCRM model coefficients are derived from the correlation between the reference luma samples and reference chroma samples
 - A TU level flag is signalled when luma cbf is non-zero
- Proposal
 - Method #1: multi-model CCRM
 - Implicitly derive whether to use multi-model CCRM or single-model CCRM
 - Disable CCRM when the luma coefficients are small
 - Method #2: CCRM merge mode
 - A CCRM merge list is constructed from previous CCRM-coded blocks
 - The first available CCRM merge candidate is used for a CCRM merge block, without index signalling
 - CCRM merge mode is signalled as a submode of CCRM

Experimental results

Method #1

	Random Access Main 10									
	Over ECM-9.0					Over EE2-3.1a				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class A1	-0.31%	-2.54%	-3.35%	102.0%	100.0%	-0.05%	-0.22%	-0.46%	100.3%	100.0%
Class A2	-0.74%	-2.41%	-3.21%	101.8%	100.4%	0.06%	0.00%	0.11%	100.6%	100.2%
Class B	0.00%	-1.53%	-1.24%	101.5%	99.8%	-0.06%	-0.33%	-0.09%	100.5%	99.9%
Class C	0.04%	-0.60%	-0.61%	102.3%	100.0%	-0.04%	0.30%	0.11%	100.2%	100.4%
Class E										
Overall (Ref)	-0.20%	-1.66%	-1.89%	101.8%	100.0%	-0.03%	-0.07%	-0.07%	100.4%	100.1%
Class D	0.03%	-0.77%	-0.52%	102.6%	100.9%	-0.06%	0.12%	0.03%	101.2%	100.3%
Class F	-0.01%	-0.39%	-0.40%	102.6%	101.9%	-0.06%	0.23%	0.26%	100.9%	100.6%

	Low delay B Main10									
	Over ECM-9.0					Over EE2-3.1a				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class A1										
Class A2										
Class B	-0.02%	-7.23%	-5.67%	101.3%	99.9%	-0.12%	0.87%	0.63%	100.2%	99.8%
Class C	0.04%	-1.67%	-2.32%	103.3%	100.0%	-0.08%	0.63%	0.45%	100.8%	99.8%
Class E	-0.05%	-1.15%	-1.31%	101.1%	99.2%	-0.15%	-0.72%	0.05%	101.4%	99.5%
Overall (Ref)	-0.01%	-3.86%	-3.46%	101.9%	99.7%	-0.12%	0.39%	0.42%	100.7%	99.8%
Class D	0.01%	-1.29%	-2.26%	104.0%	100.5%	0.04%	1.57%	0.52%	101.5%	101.1%
Class F	-0.02%	-3.59%	-3.97%	101.2%	100.8%	0.21%	0.74%	0.78%	100.2%	101.6%

Method #2

	Random Access Main 10									
	Over ECM-9.0					Over EE2-3.1a				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class A1										
Class A2										
Class B										
Class C										
Class E										
Overall (Ref)										
Class D	0.13%	-0.74%	-0.74%	103.2%	100.4%	0.04%	0.16%	-0.19%	101.3%	99.4%
Class F	-0.03%	-0.88%	-0.85%	103.0%	100.8%	-0.08%	-0.26%	-0.19%	101.5%	101.1%

[illegible]

Conclusions

- This proposal presents the results of two methods on CCRM enhancements
 - A multi-model CCRM mode
 - A CCRM merge mode
- It is recommended to further study the proposed methods in next EE