

JVET-Y0117

AHG12: ECM coding performance for HDR/WCG content and suggested common test conditions

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Dolby Laboratories, Inc.

Qualcomm Inc.

Summary of proposal

- ❖ Investigate latest ECM coding performance for HDR/WCG content
 - Setting 1: VTM HDR/WCG setting
 - Setting 2: VTM HDR/WCG setting + new ECM features to align with ECM SDR CTC
- ❖ Suggest to establish HDR/WCG common test condition for ECM with new ECM features
 - CTU 256 for 4K content
 - Resolution adaptive partitioning optimization
- ❖ Provide draft ECM HDR CTC doc based on revision of VTM HDR CTC

New encoder cfg settings to align with ECM SDR CTC

	HDR-H1 (PQ)	HDR-H2 (HLG)
AI	no change	CTUSize: 256
RA		CTUSize: 256
	MaxMTTHierarchyDepth: 4	MaxMTTHierarchyDepth: 4
	MaxMTTHierarchyDepthI: 4	MaxMTTHierarchyDepthI: 4
	MaxMTTHierarchyDepthISliceL: 4	MaxMTTHierarchyDepthISliceL: 4
	MaxMTTHierarchyDepthISliceC: 4	MaxMTTHierarchyDepthISliceC: 4
	MaxBTLumaISlice: 128	MaxBTLumaISlice: 128
	MaxBTChromaISlice: 128	MaxBTChromaISlice: 128
	MaxBTNonISlice: 128	MaxBTNonISlice: 128
	MaxTTLumaISlice: 128	MaxTTLumaISlice: 128
	MaxTTChromaISlice: 128	MaxTTChromaISlice: 128
	MaxTTNonISlice: 128	MaxTTNonISlice: 128
	MaxMTTHierarchyDepthByTid: 333322	MaxMTTHierarchyDepthByTid: 333322

classB_randomaccess.cfg

classA.cfg
classA_randomaccess.cfg

Experiment results: setting 1

All Intra									
Over VTM-11.0 MCTF									
	DE100	PSNR-L100	wPSNR			PSNR			
			Y	U	V	Y	U	V	EncT DecT
Class H1	-12.31%	-6.65%	-6.19%	-18.43%	-22.07%	-6.08%	-18.18%	-21.57%	325% 249%
Class H2						-5.88%	-12.24%	-16.13%	312% 254%
Overall	-12.31%	-6.65%	-6.19%	-18.43%	-22.07%	-6.01%	-16.02%	-19.60%	320% 250%
Random Access									
Over VTM-11.0 MCTF									
	DE100	PSNR-L100	wPSNR			PSNR			
			Y	U	V	Y	U	V	EncT DecT
Class H1	-19.21%	-11.73%	-11.19%	-25.44%	-28.46%	-11.11%	-25.07%	-28.32%	332% 427%
Class H2						-9.84%	-18.70%	-21.28%	344% 458%
Overall	-19.21%	-11.73%	-11.19%	-25.44%	-28.46%	-10.65%	-22.76%	-25.76%	336% 438%

Encoding example command for PQ:

- AI: EncoderAppECM -c encoder_intra_ecm.cfg -c classH1.cfg -c seq.cfg
- RA: EncoderAppECM -c encoder_randomaccess_ecm.cfg -c classH1.cfg -c seq.cfg

Encoding example command for HLG:

- AI: EncoderAppECM -c encoder_intra_ecm.cfg -c classH2.cfg -c seq.cfg
- RA: EncoderAppECM -c encoder_randomaccess_ecm.cfg -c classH2.cfg -c seq.cfg

Experiment results: setting 2

All Intra									
Over VTM-11.0 MCTF									
		wPSNR			PSNR				
	DE100	PSNR-L100	Y	U	V	Y	U	V	EncT DecT
Class H1	-12.31%	-6.65%	-6.19%	-18.43%	-22.07%	-6.08%	-18.18%	-21.57%	325% 249%
Class H2						-6.02%	-11.86%	-16.05%	322% 261%
Overall	-12.31%	-6.65%	-6.19%	-18.43%	-22.07%	-6.06%	-15.88%	-19.57%	324% 253%
Random Access									
Over VTM-11.0 MCTF									
		wPSNR			PSNR				
	DE100	PSNR-L100	Y	U	V	Y	U	V	EncT DecT
Class H1	-22.98%	-12.41%	-11.59%	-27.82%	-31.98%	-11.49%	-27.21%	-31.36%	404% 402%
Class H2						-10.79%	-20.84%	-24.42%	400% 469%
Overall	-22.98%	-12.41%	-11.59%	-27.82%	-31.98%	-11.24%	-24.89%	-28.84%	402% 425%

Encoding example command for PQ:

- AI: EncoderAppECM -c encoder_intra_ecm.cfg -c classH1.cfg -c seq.cfg
- RA: EncoderAppECM -c encoder_randomaccess_ecm.cfg -c classB_randomaccess.cfg -c classH1.cfg -c seq.cfg

Encoding example command for HLG:

- AI: EncoderAppECM -c encoder_intra_ecm.cfg -c classA.cfg -c classH2.cfg -c seq.cfg
- RA: EncoderAppECM -c encoder_randomaccess_ecm.cfg -c classA_randomaccess.cfg -c classH2.cfg -c seq.cfg

Conclusions

- Recommend to establish HDR/WCG CTC to facilitate performance evaluation for ECM
 - Update VTM HDR/WCG CTC by adding new ECM features and to align with ECM SDR CTC
 - Revised version of JVET-V2011 on “JVET common test conditions and evaluation procedures for HDR/WCG video” is attached to serve as the draft for recommended ECM HDR/WCG CTC
- Thanks to InterDigital for crosschecking