

PROPOSAL OF SCALABLE HEVC INITIAL TEST MODEL

Y. Ye (InterDigital), A. Fuldseth (Cisco),
W. Husak (Dolby), Chunhui Cui (ASTRI)

11th JCT-VC meeting, Oct. 2012

Proposed Initial Test Model for Scalable HEVC

- HM6.1 based available now
 - HM8.1 based available soon
- Minimal change to enhancement layer codec
 - Change limited within high level syntax
 - No change to EL block level operations
 - No change to EL prediction structure
- Use only base layer texture prediction
 - Only one coding tool: base layer reconstruction is upsampled by fixed upsampling filters and used as an additional reference picture for enhancement layer coding.
- Picture by picture two layer encoding and decoding.
- **Provide tools for memory leak check and bitstream extractor.**

Benefits

- Small changes on HM and easy to understand.
- Clean to be used as a starting point for further development.
- Base layer coding information is ready for implementing block level coding tools.
- Easily extended to multiple standard scalability, such as HEVC, H.264/AVC, MPEG-2.
- Convenient for future development and debugging, with tools of memory leak check and bitstream extractor

Performance

- JCTVC-K0045 (benchmark) vs. JCTVC-K0034

	All Intra HEVC 2x			All Intra HEVC 1.5x		
	Y	U	V	Y	U	V
Class A+	2.8%	13.4%	13.7%			
Class B	1.5%	12.2%	12.6%	0.3%	8.9%	9.8%
Overall	2.2%	12.8%	13.2%	0.3%	8.9%	9.8%
	2.2%	12.9%	13.5%	0.3%	7.8%	7.2%

	Random Access HEVC 2x			Random Access HEVC 1.5x		
	Y	U	V	Y	U	V
Class A+	7.7%	18.4%	19.5%			
Class B	5.5%	13.5%	15.1%	4.7%	12.1%	14.2%
Overall	6.6%	15.9%	17.3%	4.7%	12.1%	14.2%
	6.6%	15.8%	17.2%	4.7%	12.0%	14.0%

	Hybrid vs HEVC 2x			Hybrid vs HEVC 1.5x		
	Y	U	V	Y	U	V
Class A+	7.5%	16.7%	17.8%			
Class B	4.6%	12.2%	13.7%	3.9%	9.7%	11.3%
Overall	6.0%	14.5%	15.7%	3.9%	9.7%	11.3%
	6.0%	14.4%	15.7%	3.9%	9.6%	11.2%

	Hybrid vs AVC 2x			Hybrid vs AVC 1.5x		
	Y	U	V	Y	U	V
Class A+	7.5%	16.7%	17.8%			
Class B	4.6%	12.2%	13.7%	3.9%	9.7%	11.3%
Overall	6.0%	14.5%	15.7%	3.9%	9.7%	11.3%
	6.0%	14.4%	15.7%	3.9%	9.6%	11.2%

	Random Access HEVC SNR		
	Y	U	V
Class A+	4.7%	15.1%	16.8%
Class B	5.0%	13.8%	17.7%
Overall	4.9%	14.4%	17.2%
	4.9%	14.3%	17.0%

Luma BD-rate gap

- AI: 0.3-2.2%
- RA: 4.7-6.6%
- Hybrid: 3.9-6.0%
- SNR: 4.9%

Performance

- JCTVC-K0045 (benchmark) vs. JCTVC-K0034 (w/o EEF)

	All Intra HEVC 2x			All Intra HEVC 1.5x		
	Y	U	V	Y	U	V
Class A+	3.1%	13.4%	13.8%			
Class B	1.7%	12.3%	12.7%	0.4%	9.0%	9.9%
Overall	2.4%	12.9%	13.2%	0.4%	9.0%	9.9%
	2.4%	13.0%	13.5%	0.4%	7.8%	6.9%

Luma BD-rate gap

- AI: 0.4-2.4%
- RA: 5.2-6.9%
- SNR: 5.0%

	Random Access HEVC 2x			Random Access HEVC 1.5x		
	Y	U	V	Y	U	V
Class A+	7.9%	18.5%	19.8%			
Class B	5.9%	14.3%	15.9%	5.2%	12.8%	14.9%
Overall	6.9%	16.4%	17.8%	5.2%	12.8%	14.9%
	6.9%	16.3%	17.7%	5.2%	12.7%	14.7%

	Random Access HEVC SNR		
	Y	U	V
Class A+	4.7%	15.1%	16.9%
Class B	5.3%	14.6%	18.3%
Overall	5.0%	14.8%	17.6%
	5.0%	14.7%	17.4%