

CE7-related: Context reduction for entropy coding sig_coeff_flag(JVET-00928)

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Overall Summary

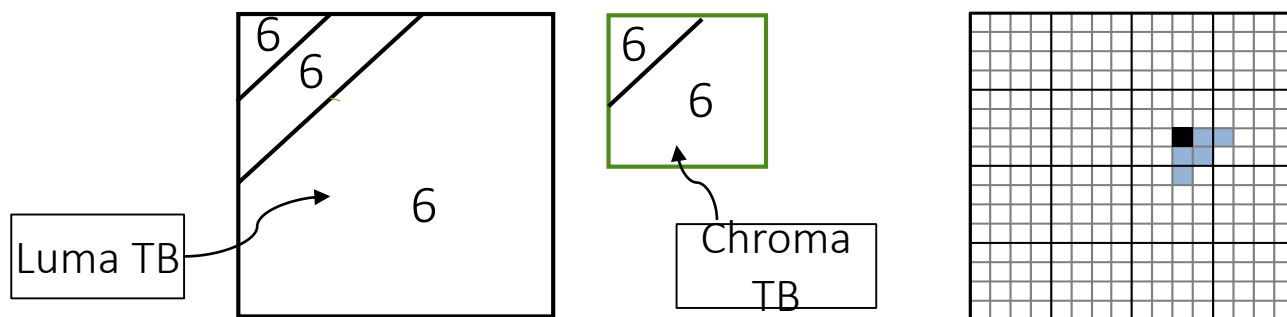
- In VVC Draft 5, the total number of the context variables for entropy coding the syntax element `sig_coeff_flag` is significantly increased by allocating three separate sets of context variables for different dependent quantization states
- Proposes to reduce the number of context variables in the two additional context sets associated with dependent quantization states 2 and 3
- Summary of average luma BD bitrate results

Context Modeling for sig_coeff_flag in VVC Draft 5

- Each transform block divided into 3 zones for luma or 2 zones for chroma.
- Each subset contains 6 context variables with context selection determined by

$$\text{ctxInc} = \text{Min}(\text{locSumAbsPass1}, 5)$$

- Context modeling for dependent quantization states 0 and 1 share the same set of 30 context variables
- 2 additional context sets allocated for quantization states 2 and 3, respectively. The 90 total context variables allocated for entropy coding sig_coeff_flag

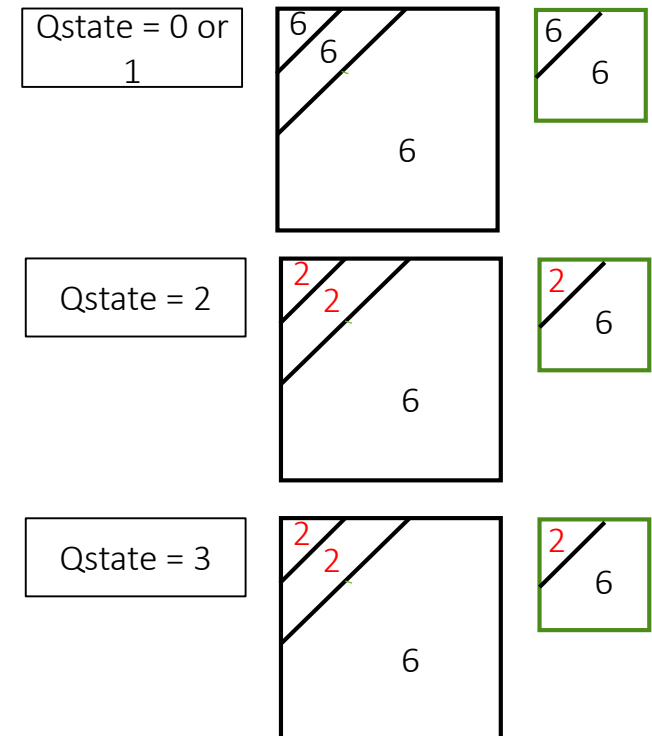


Proposed Method

- The number of the context variables reduced to 2 in some context subsets associated with QState = 2 or 3, with context selection determined by

$$\text{ctxInc} = (\text{locSumAbsPass1} == 0) ? 0 : 1$$

- Context reduction applied to
 - 4 luma context subsets
 - 2 chroma context subsets
- Leading to overall context reduction by 24
 - 40% of the number of contexts for dependent quantization states 2 & 3



Experimental Results

- Anchor: VTM-5.0 under the common test conditions (CTCs)
- Test: Method 1 with context reduction by 24

All Intra Main10					
Over VTM-5.0					
	Y	U	V	EncT	DecT
Class A1	0.00%	-0.06%	0.03%	100%	99%
Class A2	0.00%	-0.01%	-0.06%	100%	101%
Class B	0.01%	-0.09%	0.02%	100%	97%
Class C	0.01%	-0.10%	0.03%	100%	98%
Class E	0.01%	-0.05%	-0.05%	100%	97%
Overall	0.01%	-0.07%	0.00%	100%	98%
Class D	-0.01%	0.18%	-0.06%	100%	97%
Class F	-0.01%	0.02%	0.02%	99%	98%
Random Access Main 10					
Over VTM-5.0					
	Y	U	V	EncT	DecT
Class A1	0.00%	0.05%	0.07%	99%	98%
Class A2	0.02%	0.02%	-0.10%	99%	101%
Class B	0.01%	-0.02%	-0.35%	99%	94%
Class C	-0.04%	-0.11%	-0.18%	99%	92%
Overall	0.00%	-0.02%	-0.17%	99%	96%
Class D	0.02%	-0.11%	0.04%	98%	95%
Class F	-0.01%	-0.02%	0.06%	99%	92%
Low delay B Main10					
Over VTM-5.0					
	Y	U	V	EncT	DecT
Class B	-0.01%	0.09%	0.08%	99%	97%
Class C	0.02%	0.21%	-0.01%	99%	95%
Class E	-0.20%	-0.30%	-0.03%	99%	95%
Overall	-0.05%	0.03%	0.02%	99%	96%
Class D	0.02%	-0.30%	0.56%	97%	95%
Class F	-0.01%	-0.46%	0.69%	97%	94%