

Non-CE6: JVET-O0380
Simplification on MTS index coding

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First Choice for Security Professionals

Outline

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- Proposed method
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Introduction

- Transform pair and signaling of MTS in VTM5.0

tu_mts_idx	transform type		MTS binIdx			
	horizontal	vertical	0	1	2	3
1	DCT2	DCT2	0			
2	DST7	DST7	1	0		
3	DCT8	DST7	1	1	0	
4	DST7	DCT8	1	1	1	0
5	DCT8	DCT8	1	1	1	1

Syntax element	binIdx					
	0	1	2	3	4	>= 5
tu_mts_idx (MTS)	1...6 (1 + cqtDepth)	7	8	9	na	na

Proposed MTS index Coding

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- Context modelling for MTS with proposed method

- #Method 1

Syntax element	binIdx					
	0	1	2	3	4	>= 5
tu_mts_idx	0	1	2	3	na	na

5 context reduced

- #Method 2

Syntax element	binIdx					
	0	1	2	3	4	>= 5
tu_mts_idx	0	1	bypass	bypass	na	na

7context reduced, 2 context coded bin reduced.

Experimental Results for method 1

	All Intra Main10 Over VTM-5.0				
	Y	U	V	EncT	DecT
Class A1	0.00%	0.01%	-0.03%	99%	99%
Class A2	0.00%	-0.05%	-0.06%	99%	99%
Class B	0.01%	-0.04%	0.07%	100%	99%
Class C	0.00%	-0.08%	0.05%	100%	95%
Class E	-0.01%	-0.02%	-0.04%	99%	100%
Overall	0.00%	-0.04%	0.01%	100%	98%
Class D	0.02%	0.01%	-0.09%	100%	100%
Class F (optional)	-0.01%	-0.04%	-0.09%	99%	98%

	Random access Main10 Over VTM-5.0				
	Y	U	V	EncT	DecT
Class A1	0.00%	-0.20%	0.09%	100%	99%
Class A2	0.01%	0.13%	-0.01%	100%	99%
Class B	0.00%	-0.13%	-0.14%	100%	100%
Class C	-0.08%	0.01%	-0.15%	100%	102%
Class E					
Overall	-0.02%	-0.06%	-0.07%	100%	100%
Class D	-0.02%	0.23%	0.14%	101%	102%
Class F	0.00%	-0.05%	0.03%	100%	101%

	Low delay B Main10 Over VTM-5.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	0.02%	0.19%	-0.01%	100%	98%
Class C	0.07%	0.05%	0.21%	100%	99%
Class E	0.01%	0.62%	0.62%	100%	100%
Overall	0.03%	0.25%	0.22%	100%	99%
Class D	-0.01%	-0.36%	-0.01%	100%	102%
Class F	-0.06%	0.21%	0.38%	100%	99%

Thanks interdigital for cross-checking

Experimental Results for method 1

	Random access Main10 Over VTM-5.0+InterMTS				
	Y	U	V	EncT	DecT
Class A1	-0.01%	-0.02%	0.10%	100%	100%
Class A2	0.00%	-0.02%	-0.01%	100%	101%
Class B	-0.02%	-0.13%	-0.12%	100%	100%
Class C	-0.05%	0.04%	-0.04%	100%	101%
Class E					
Overall	-0.02%	-0.04%	-0.03%	100%	101%
Class D	-0.08%	0.12%	-0.23%	100%	100%
Class F	-0.04%	-0.11%	-0.04%	101%	100%

	Low delay B Main10 Over VTM-5.0+InterMTS				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	0.00%	-0.02%	0.17%	100%	100%
Class C	-0.06%	-0.03%	-0.08%	100%	101%
Class E	-0.05%	-0.23%	0.51%	99%	100%
Overall	-0.03%	-0.08%	0.17%	100%	100%
Class D	-0.11%	-0.62%	0.14%	100%	100%
Class F	-0.19%	-0.04%	-0.20%	99%	99%

Thanks interdigital for cross-checking

Experimental Results for method 2

	All Intra Main10				
	Over VTM-5.0				
	Y	U	V	EncT	DecT
Class A1	0.00%	0.05%	-0.02%	100%	99%
Class A2	0.00%	-0.07%	-0.07%	100%	99%
Class B	0.01%	-0.03%	0.06%	100%	101%
Class C	0.00%	-0.08%	0.05%	101%	104%
Class E	-0.01%	-0.01%	-0.04%	100%	103%
Overall	0.00%	-0.03%	0.01%	101%	101%
Class D	0.01%	0.02%	-0.09%	101%	105%
Class F	-0.01%	-0.04%	-0.09%	100%	100%

	Random access Main10				
	Over VTM-5.0				
	Y	U	V	EncT	DecT
Class A1	-0.01%	-0.20%	0.10%	99%	99%
Class A2	0.00%	0.05%	-0.06%	99%	99%
Class B	0.01%	-0.16%	-0.19%	100%	100%
Class C	-0.07%	0.01%	-0.14%	100%	102%
Class E					
Overall	-0.02%	-0.08%	-0.09%	100%	100%
Class D	-0.02%	0.22%	0.13%	101%	103%
Class F	0.00%	-0.02%	0.03%	100%	101%

	Low delay B Main10				
	Over VTM-5.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	-0.01%	0.40%	0.04%	99%	97%
Class C	0.05%	0.10%	-0.29%	100%	99%
Class E	0.11%	0.28%	0.59%	100%	99%
Overall	0.04%	0.27%	0.07%	100%	98%
Class D	0.04%	0.10%	0.55%	100%	102%
Class F	-0.09%	-0.21%	-0.02%	100%	99%

Thanks interdigital for cross-checking

Experimental Results for method 2

	Random access Main10 Over VTM-5.0+InterMTS				
	Y	U	V	EncT	DecT
Class A1	-0.01%	-0.04%	0.16%	100%	100%
Class A2	-0.02%	0.06%	0.10%	100%	100%
Class B	-0.01%	-0.14%	-0.03%	100%	100%
Class C	-0.09%	0.08%	-0.22%	100%	101%
Class E					
Overall	-0.03%	-0.02%	-0.02%	100%	100%
Class D	-0.09%	0.15%	-0.23%	100%	104%
Class F	-0.01%	-0.09%	0.00%	100%	101%

	Low delay B Main10 Over VTM-5.0+InterMTS				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	-0.01%	0.24%	-0.11%	100%	100%
Class C	-0.05%	0.27%	-0.15%	100%	99%
Class E	-0.04%	0.07%	1.41%	100%	98%
Overall	-0.03%	0.21%	0.26%	100%	99%
Class D	-0.07%	-0.28%	-0.17%	100%	103%
Class F	-0.10%	0.26%	-0.04%	100%	99%

Thanks interdigital for cross-checking

Conclusion

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- This contribution proposed 2 MTS index coding methods:
  - method 1: 5 context reduced.
  - method 2: 7context reduced, 2 context coded bin reduced.

- Experimental results for proposed method :
  - method 1 : 0.00%, -0.02% and 0.03% for AI, RA and LB.
    - Inter MTS on: -0.02% and -0.03% for RA and LB
  - method 2: 0.00%, -0.02% and 0.04% for AI, RA and LB.
    - Inter MTS on: -0.03% and -0.03% for RA and LB.

- It is recommendable to adopt method 2 into VVC.

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Thank you!