

JVET-P0309

Non-CE4: Improved Signaling Method for Merge Modes

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Hikvision

Introduction

- VTM6.0 adopts the new signaling method.
- Regular merge mode is coded with long bins while it has high selected probability.

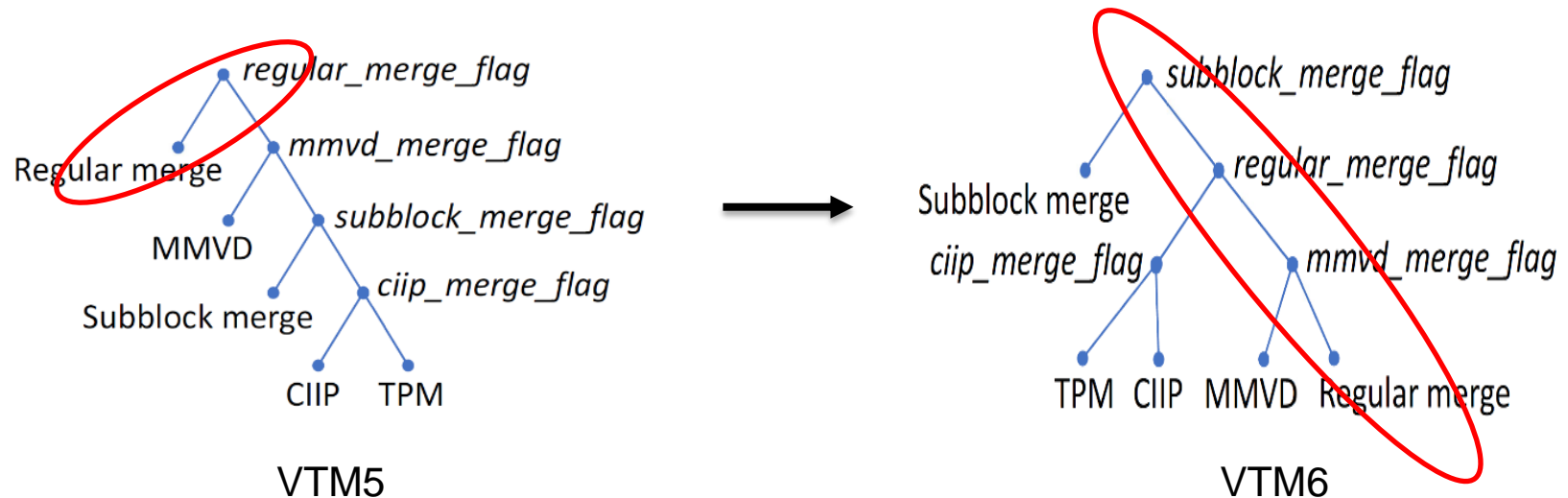


Fig 1. The signaling methods for merge mode in VTM5 and VTM6

Proposed signaling method

- The selected probability distribution of each mode in VTM6.0

Table 1. The selected probability distribution of each mode in VTM6.0

QP	Sub-block mode	Regular Merge mode	MMVD mode	TPM mode	CIIP mode
27	20%	46%	18%	12%	3%
32	28%	41%	16%	11%	3%
37	37%	36%	14%	9%	3%
42	51%	27%	12%	8%	2%

Proposed signaling method

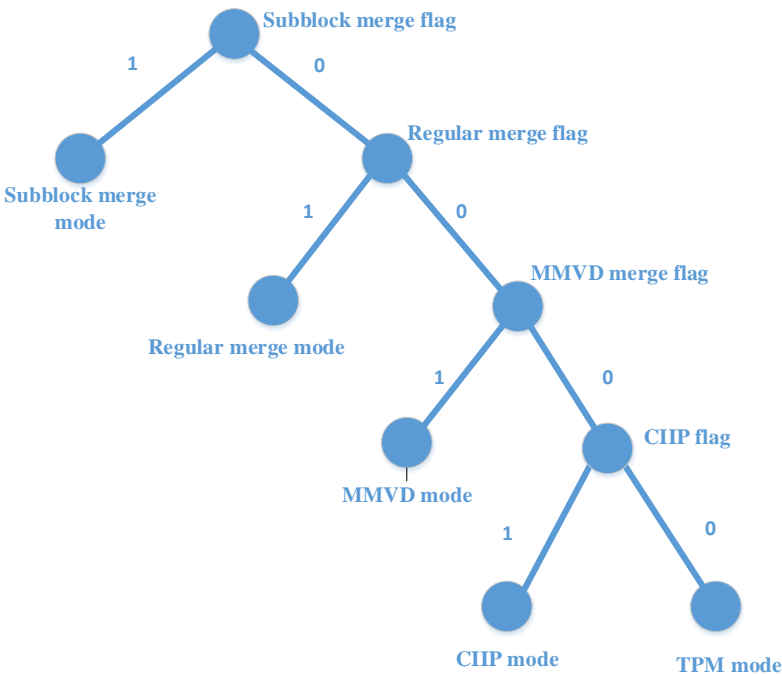


Table 2 The decoding condition of the related flags

Related Flag	Decoding Condition	Inferred Value
Subblock merge flag	SubblockAvailable	0
Regular merge flag	MMVDAvailable CIIPAvailable TriangleAvailable	1
MMVD merge flag	MMVDAvailable && (CIIPAvailable TriangleAvailable)	MMVDAvailable
CIIP flag	CIIPAvailable && TriangleAvailable	CIIPAvailable

Fig 2. The proposed signaling method

Experimental Results

■ Results of Test 1

	Random access Main10				
	Over VTM-6.0				
	Y	U	V	EncT	DecT
Class A1	-0.01%	0.11%	0.03%	99%	98%
Class A2	-0.01%	0.12%	0.06%	100%	98%
Class B	-0.02%	0.14%	0.12%	100%	101%
Class C	-0.01%	0.11%	0.06%	100%	103%
Class E					
Overall	-0.01%	0.12%	0.08%	100%	100%
Class D	-0.05%	-0.14%	-0.16%	100%	101%
Class F	-0.06%	-0.02%	0.05%	100%	101%

	Low delay B Main10				
	Over VTM-6.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	0.00%	0.04%	0.01%	100%	99%
Class C	-0.05%	0.14%	-0.02%	100%	99%
Class E	-0.25%	0.40%	0.06%	100%	98%
Overall	-0.08%	0.16%	0.01%	100%	99%
Class D	-0.05%	0.24%	0.36%	100%	99%
Class F	-0.12%	-0.20%	0.02%	100%	100%

Thank Peking University for the cross-checking!

Experimental Results

- Results of Test 2 (Remove the influence of the context initialization values for the related flag)

	Random access Main10				
	Over VTM-6.0				
	Y	U	V	EncT	DecT
Class A1	-0.05%	0.04%	-0.02%	100%	100%
Class A2	-0.08%	0.03%	0.07%	100%	100%
Class B	-0.07%	-0.01%	-0.06%	100%	100%
Class C	-0.12%	-0.10%	-0.19%	100%	100%
Class E					
Overall	-0.08%	-0.02%	-0.06%	100%	100%
Class D	-0.19%	-0.32%	-0.36%	100%	100%
Class F	-0.03%	-0.08%	-0.09%	100%	100%

	Low delay B Main10				
	Over VTM-6.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	-0.05%	-0.17%	-0.21%	100%	99%
Class C	-0.13%	-0.10%	-0.15%	99%	98%
Class E	-0.18%	0.31%	-0.19%	98%	98%
Overall	-0.11%	-0.02%	-0.19%	100%	99%
Class D	-0.14%	-0.31%	0.44%	99%	99%
Class F	-0.09%	-0.19%	-0.35%	100%	99%

Experimental Results

- Similar to JVET-N0324, the average number of context coded bins for skip and merges are also calculated.

Table 3 The average number of context bins to signal skip/merge modes

Testing points	VTM6		JVET-P0309	
	Skip	Merge	Skip	Merge
FoodMarket4 @QP22 under RA	2.63	2.46	1.96	2.24
FoodMarket4 @QP37 under RA	2.51	2.39	1.88	2.29
ParkRunning3 @QP22 under RA	2.50	2.49	1.84	2.16
ParkRunning3 @QP37 under RA	2.60	2.66	2.05	2.72
BQTerrace @QP22 under LD	2.56	2.69	1.85	1.99
BQTerrace @QP37 under LD	2.44	2.47	1.93	2.27
BasketballDrive @QP22 under LD	2.44	2.46	1.85	2.21
BasketballDrive @QP37 under LD	2.18	2.43	1.86	2.41

Conclusion

- Propose a new signaling method that aligned with the selected distribution
 - 0.08% and 0.11% coding gains for RA and LB configurations
 - Reduce the context coded bins by 0.6 approximately

Thank you !

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