

JVET-N0165

On spatial candidate list construction

Hikvision

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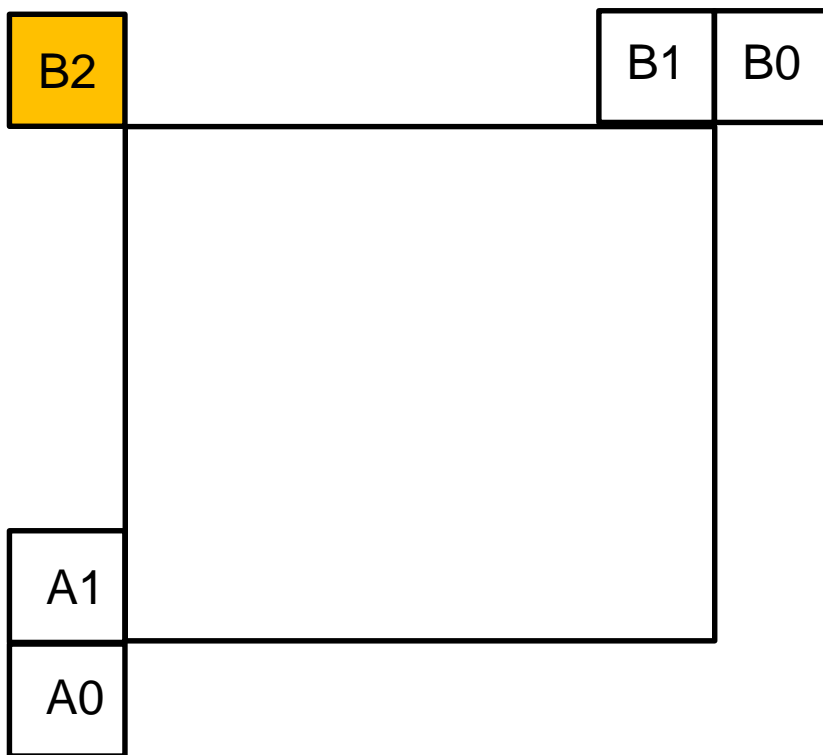
- Current Spatial Candidate list construction for Merge Mode and AMVP ( left candidate first, then above one)

Regular merge	Triangle merge	IBC merge	Affine merge (Inheritance part)	ATMVP
A1-B1-B0-A0-B2	A1-B1-B0-A0-B2	A1-B1-B0-A0-B2	A0-A1-B0-B1-B2	A1

Regular AMVP	IBC AMVP	Affine AMVP (Inheritance part)
Check left: A0-A1- (scaledA0-ScaledA1),  Then  Check above: B0-B1-B2- (scaledB0-ScaledB1- ScaledB2)	Check left: A0-A1,  Then  Check above: B0-B1-B2	Check left: A0-A1,  Then  Check above: B0-B1-B2

# Proposed Method

- Part 1: Access the above candidate first, then the left one
- Part 2: Remove B2 (above-left) candidate to reduce access number and motion storage



# Proposed Method-Part1

## ■ Reorder

- Check above spatial candidate first, then left one

Regular merge	Triangle merge	IBC merge	Affine merge (Inheritance part)	ATMVP
B1-A1-A0-B0-B2	B1-A1-A0-B0-B2	B1-A1-A0-B0-B2	B0-B1-B2-A0-A1	B1

Regular AMVP	IBC AMVP	Affine AMVP (Inheritance part)
Check above: B0-B1-B2- (scaledB0-ScaledB1- ScaledB2)  Then  Check left: A0-A1- (scaledA0-ScaledA1)	Check above: B0-B1-B2,  Then  Check left: A0-A1	Check above: B0-B1-B2,  Then  Check left: A0-A1

# Proposed Method-Part2

- Removing B2 for all the motion list

Regular merge	Triangle merge	IBC merge	Affine merge (Inheritance part)
A1-B1-B0-A0	A1-B1-B0-A0	A1-B1-B0-A0	A0-A1-B0-B1

Regular AMVP	IBC AMVP	Affine AMVP (Inheritance part)
Check left: A0-A1- (scaledA0-ScaledA1), Then Check above: B0-B1- (scaledB0-ScaledB1)	Check left: A0-A1, Then Check above: B0-B1	Check left: A0-A1, Then Check above: B0-B1

# Experimental Results-Part1

Test1: Reorder the candidates

	Random access Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1	-0.04%	-0.14%	-0.09%	99%	100%
Class A2	-0.02%	-0.01%	-0.01%	99%	100%
Class B	-0.03%	-0.01%	-0.12%	99%	97%
Class C	-0.07%	-0.19%	-0.14%	99%	98%
Class E					
<b>Overall</b>	-0.04%	-0.08%	-0.10%	99%	98%
Class D	-0.08%	-0.22%	-0.09%	99%	103%
Class F	0.00%	-0.02%	-0.06%	99%	100%
	Low delay B Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	-0.05%	-0.09%	-0.26%	100%	98%
Class C	-0.12%	0.17%	-0.23%	99%	99%
Class E	-0.28%	-0.64%	-1.25%	99%	99%
<b>Overall</b>	-0.13%	-0.14%	-0.50%	100%	99%
Class D	-0.10%	-0.29%	-0.67%	99%	96%
Class F	-0.10%	0.20%	0.09%	99%	98%

Thank for Peking university the crosscheck.

# Experimental Results-Part2

Test2: Remove all B2 for merge list.

Test3: Remove all B2 for merge and AMVP list.

Test4: Only remove B2 for regular merge list.

	Test2			Test3			Test4		
RA	0.03%	0.01%	-0.01%	0.05%	0.01%	0.01%	0.02%	-0.04%	-0.01%
LB	0.04%	0.19%	-0.03%	0.02%	0.12%	-0.08%	0.01%	0.01%	-0.17%

Thank for Peking university the crosscheck.

# Experimental Results-Part2

Test2: Remove B2 for all merge list

	Random access Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1	0.02%	0.09%	-0.01%	99%	100%
Class A2	0.02%	0.07%	0.04%	99%	99%
Class B	0.03%	-0.07%	0.06%	99%	98%
Class C	0.06%	0.01%	-0.12%	99%	99%
Class E					
Overall	0.03%	0.01%	-0.01%	99%	99%
Class D	-0.02%	-0.05%	-0.05%	99%	104%
Class F	0.02%	-0.05%	-0.05%	99%	99%
	Low delay B Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	0.01%	-0.05%	-0.09%	100%	100%
Class C	0.02%	0.24%	0.22%	100%	101%
Class E	0.12%	0.54%	-0.28%	99%	101%
Overall	0.04%	0.19%	-0.03%	100%	101%
Class D	-0.04%	-0.44%	-0.61%	99%	96%
Class F	-0.06%	0.06%	0.19%	99%	99%

Thank for Peking university the crosscheck.



# Experimental Results-Part2

Test3: Remove B2 for merge and AMVP list

	Random access Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1	0.04%	0.13%	0.03%	99%	100%
Class A2	0.06%	-0.02%	0.09%	100%	98%
Class B	0.06%	0.00%	0.01%	99%	99%
Class C	0.04%	-0.04%	-0.05%	99%	99%
Class E					
Overall	0.05%	0.01%	0.01%	99%	99%
Class D	0.01%	0.01%	-0.06%	99%	102%
Class F	0.00%	-0.02%	-0.04%	99%	100%
	Low delay B Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	0.01%	-0.04%	0.03%	100%	101%
Class C	-0.01%	0.24%	-0.06%	101%	102%
Class E	0.08%	0.23%	-0.29%	100%	101%
Overall	0.02%	0.12%	-0.08%	100%	101%
Class D	-0.02%	0.44%	0.23%	100%	101%
Class F	-0.12%	-0.12%	-0.93%	100%	100%

Thank for Peking university the crosscheck.

# Experimental Results-Part2

Test4: Only remove B2 for regular merge list

	Random access Main10				
	Over HM-16.18				
	Y	U	V	EncT	DecT
Class A1	0.03%	-0.03%	0.03%	101%	102%
Class A2	0.02%	-0.01%	0.03%	101%	99%
Class B	0.03%	-0.09%	0.00%	100%	99%
Class C	0.02%	0.00%	-0.06%	100%	99%
Class E					
Overall	0.02%	-0.04%	-0.01%	100%	100%
Class D	0.01%	-0.06%	-0.02%	100%	101%
Class F	0.01%	0.06%	-0.04%	100%	100%
	Low delay B Main10				
	Over HM-16.18				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	-0.01%	-0.18%	-0.33%	100%	99%
Class C	-0.01%	0.23%	0.15%	100%	102%
Class E	0.09%	0.02%	-0.33%	100%	100%
Overall	0.01%	0.01%	-0.17%	100%	100%
Class D	-0.01%	-0.34%	-0.57%	100%	99%
Class F	-0.12%	-0.56%	0.41%	100%	98%

Thank for Peking university the crosscheck.

- This contribution proposes a candidate list construction method for merge mode and AMVP mode.
  - Change the access order of spatial candidates (0.13% gains for LB)
  - Remove B2 for all motion list (at most 0.05% loss for RA, 0.02% loss for LB)
- As it is simple but valid method , it is recommendable to be adopted in the next version of VTM .

**Thank you !**

