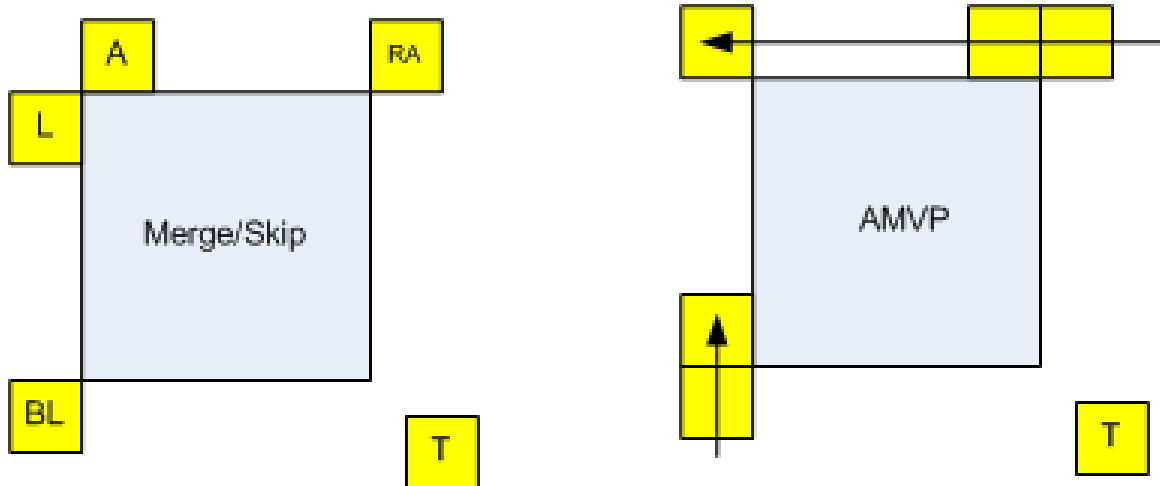JCTVC-F297
CE9(UNI03): Unified Merge and AMVP candidates selection

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# Candidates of Merge/Skip and AMVP in HM3.0

- Candidate locations for Merge/skip and AMVP mode in HM3.0
  - 5 for merge, 6 for AMVP ➔ 8 different positions totally
  - Merge/Skip and AMVP use different candidates
  - May increase the number of memory access at encoder

- Look for unified candidates for both modes
  - Align Merge/skip candidates to those of AMVP ➔ 6 different positions totally!
  - Align AMVP candidates to those of Merge/skip

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Proposed unification method

- Align Merge candidates to AMVP candidates

From collocated picture
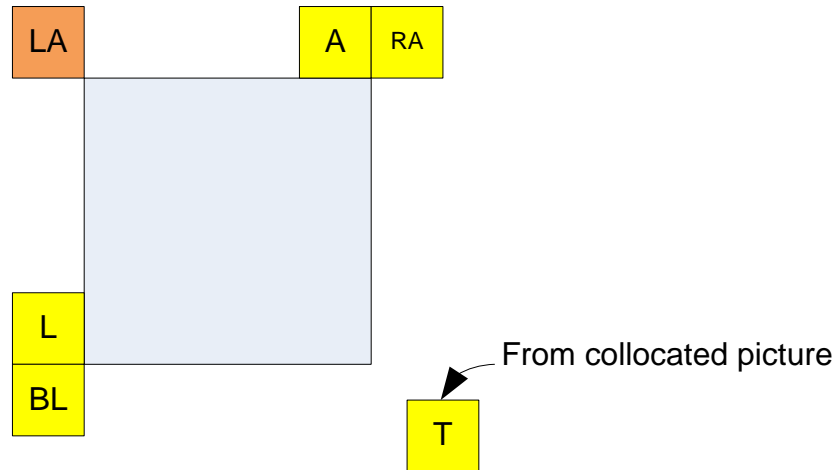
- AMVP keeps no change

- Merge candidate checking procedure:
  - Check L and BL
  - Check A and RA
  - If there is non-available candidate in L, BL, A, or RA
    - Check LA
    - If LA is available, put LA in the first non-available position in the order (L, BL, A, RA)

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Simulation Results

- HM 3.0 with bug 146 fixed (CE9 anchor)
- Common test condition defined in JCTVC-E700
- Proposed method was cross verified by MediaTek
- BD bitrate saving (%)

	HE			LC		
	Y	U	V	Y	U	V
RA	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
LB	-0.2	-0.3	-0.2	-0.2	-0.1	0.0
LP	-0.2	-0.3	0.0	-0.2	-0.2	-0.1
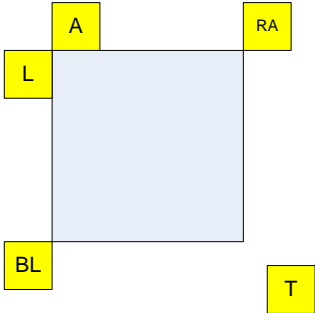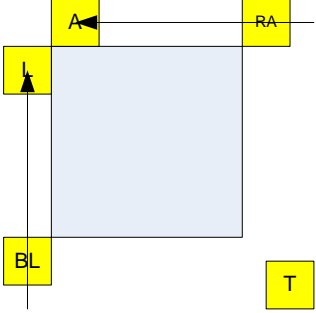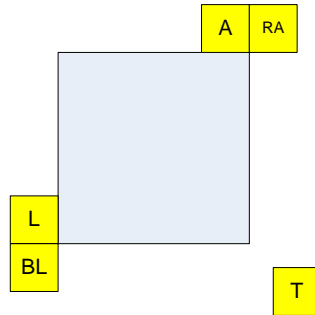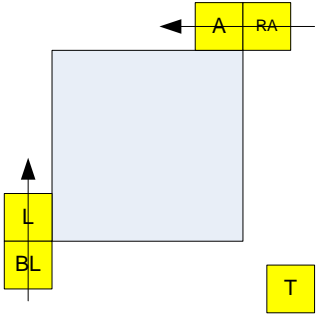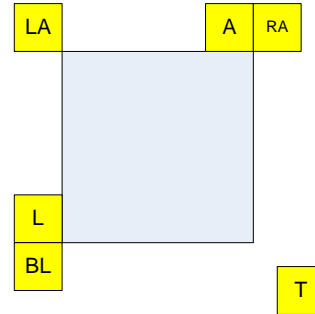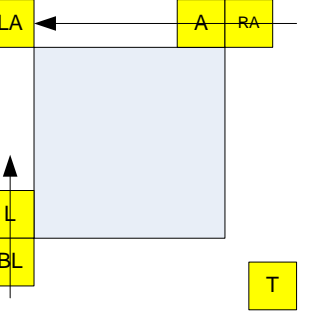
- Complexity (enc,dec time ratio)

	HE		LC	
	Encoder	Decoder	Encoder	Decoder
RA	101%	97%	100%	101%
LB	100%	98%	100%	101%
LP	100%	97%	100%	101%

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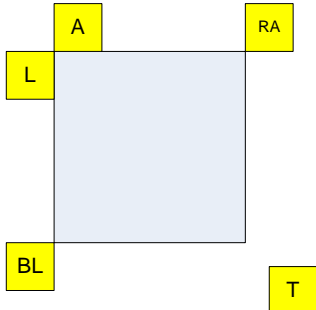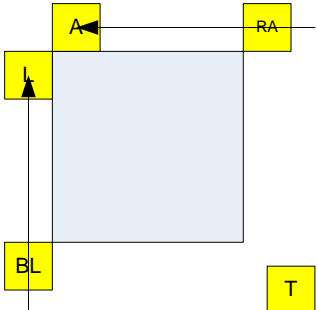
Conclusion

- **Unification of Merge and AMVP candidate selection solution is proposed**
  - The total number of candidates is reduced from 8 to 6

- **Performance**
  - Coding performance: 0.2% BD bitrate saving in all six cases
  - No obvious complexity increasing in term of encoding and decoding time

- **Recommend for adoption**

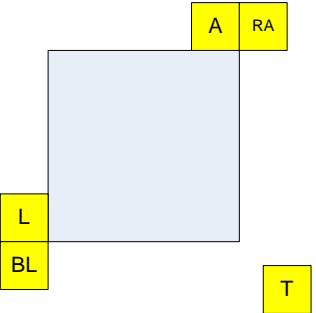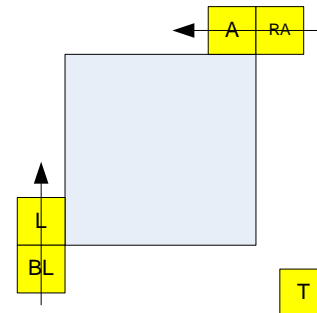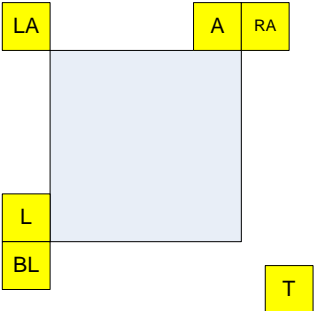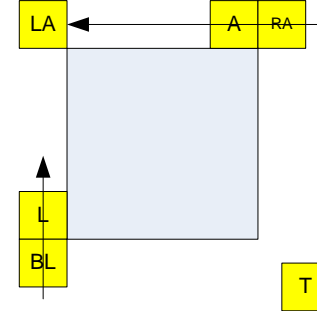# Alternative unification solutions based on current HM3.0

Solution	Merge	AMVP	BD bitrate saving (%)							
				HE			LC			
				Y	U	V	Y	U	V	
A			RA	0.1	0.1	0.1	0.1	0.1	0.1	
			LB	0.0	0.0	0.1	0.0	0.1	0.0	
			LP	0.0	0.0	0.2	0.0	0.2	0.0	
B			RA	0.0	0.0	0.0	0.0	0.0	0.0	
			LB	-0.1	-0.1	-0.1	0.0	0.0	0.1	
			LP	-0.1	0.0	0.0	0.0	0.2	0.0	
C			RA	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	
			LB	-0.2	-0.3	-0.2	-0.2	-0.1	0.0	
			LP	-0.2	-0.3	0.0	-0.2	0.0	-0.2	

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Alternative unification solution based on current HM3.0

Solution	Merge	AMVP	Enc & Dec Time Ratio (%)					
					HE		LC	
				Enc	Dec	Enc	Dec
A			RA	101	101	100	97
			LB	100	100	99	99
			LP	100	101	99	99
B			RA	101	98	100	98
			LB	98	99	100	99
			LP	99	97	100	98
C			RA	101	97	100	101
			LB	100	98	100	101
			LP	100	97	99	101