

**Dependency removal of
temporal merge candidate
and combined bi-predictive merge
candidate derivation**

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Summary

□ Proposal

- ❖ Use only spatial merge candidates for combined bi-predictive merge candidate derivation

□ Benefits

- ❖ Reducing the number of cycles for the worst case in merge mode
- ❖ One unified logic of combined bi-predictive merge candidate derivation for TMVP on and off cases.

□ Results

- ❖ 0.1% loss on average

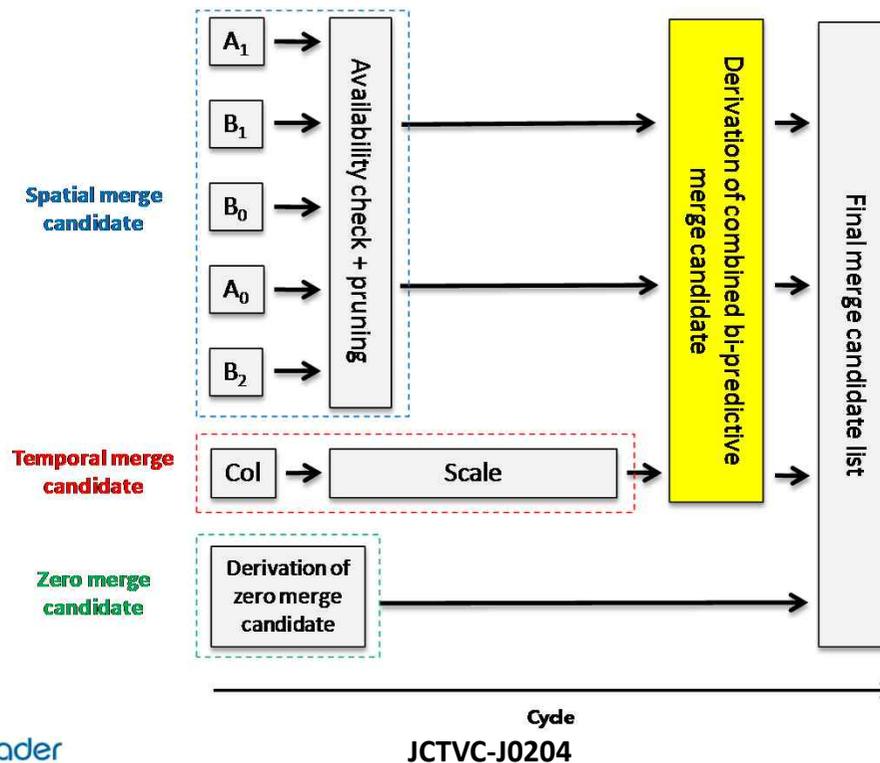
HM 7.0

❑ Derivation of combined bi-predictive merge candidate depends on

1. The spatial merge candidates
2. The temporal merge candidate.
 - Requires more cycles than spatial merge candidate.

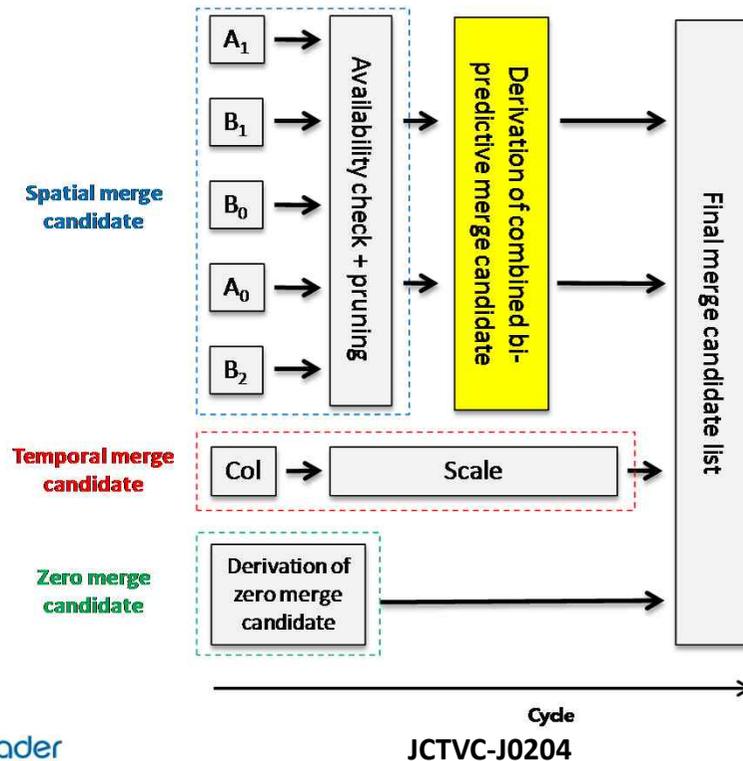
❑ Combined bi-predictive merge candidate derivation

- ❖ Prevents the possibility of throughput improvement of merge mode.



Proposal

- ❑ Derivation of combined bi-predictive merge candidate depends on
 1. The spatial merge candidates only
- ❑ By removing dependency between the temporal merge candidate and the combined bi-predictive merge candidate derivation,
 - ❖ The throughput of merge mode can be improved.
 - ❖ Combined bi-predictive merge candidate derivation logic for TMVP on and off can be unified.



Experimental results

□ Results

- ❖ 0.1% of coding loss for MAIN-RA, HE10-RA, and MAIN-LB
- ❖ 0.2% of coding loss for HE10-LB

Confirmed by
Sony (JCTVC-J0381)

	Random Access Main			Random Access HE10		
	Y	U	V	Y	U	V
Class A	0.1%	-0.1%	0.0%	0.1%	-0.1%	0.2%
Class B	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Class C	0.1%	0.2%	0.2%	0.1%	0.1%	0.0%
Class D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Class E						
Overall	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
Class F	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
Enc Time[%]		102%			101%	
Dec Time[%]		100%			100%	

	Low delay B Main			Low delay B HE10		
	Y	U	V	Y	U	V
Class A						
Class B	0.2%	0.2%	0.0%	0.2%	0.2%	0.2%
Class C	0.2%	0.2%	0.2%	0.2%	0.2%	0.4%
Class D	0.1%	0.1%	0.4%	0.2%	0.5%	0.2%
Class E	-0.1%	0.3%	-0.1%	0.1%	-0.2%	-0.2%
Overall	0.1%	0.2%	0.1%	0.2%	0.2%	0.2%
	0.1%	0.2%	0.1%	0.2%	0.2%	0.3%
Class F	-0.1%	0.3%	0.2%	0.2%	0.4%	1.0%
Enc Time[%]		101%			101%	
Dec Time[%]		99%			99%	

Conclusions

Proposal

- ❖ Use only spatial merge candidates for combined bi-predictive merge candidate derivation

Benefits

- ❖ Reducing the number of cycles for the worst case in merge mode
- ❖ One unified logic of combined bi-predictive merge candidate derivation for TMVP on and off cases.

Modification

- ❖ On text: 7 lines modified
- ❖ On S/W: 1 line replaced and 6 lines added

Results

- ❖ 0.1% loss on average

Very similar to JCTVC-J0170 (Canon)

We suggest the proposal to be included in DIS.



Thank You Very Much !

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