

JVET-AG0073

Non-EE2: Chained motion vector prediction

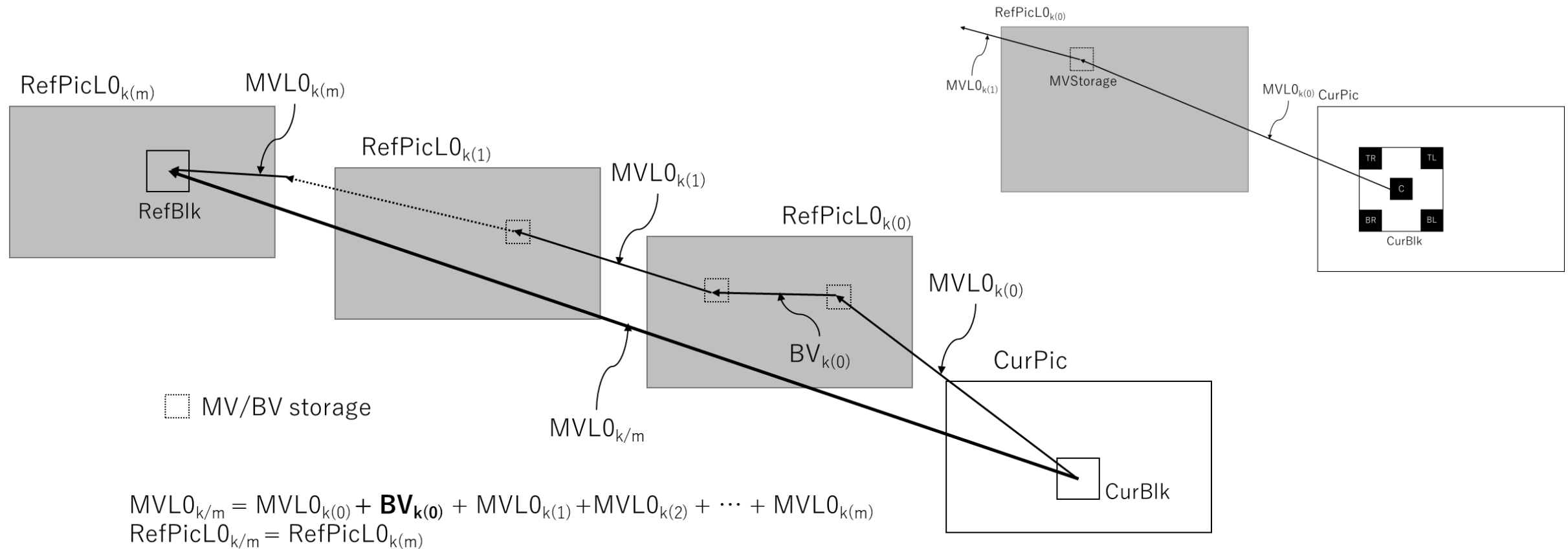
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- EE2-1.8 proposes recursively traced BVP as IBC AMVP/merge candidates.
- Inspired by EE2-1.8, recursively traced MVP, i.e., chained MVP (CMVP), is proposed as inter merge candidates.
- Experimental results show a maximum **-0.42%** coding gains under LDB.

The length of the chained MVP trace depth is 1 as like as EE2-1.8a

	Y	U	V	EncT	DecT
RA	-0.10%	-0.20%	-0.27%	99.9%	100.5%
LDB	-0.42%	-0.20%	-0.32%	100.1%	102.1%
LDP	-0.28%	-0.46%	-0.54%	100.1%	101.7%

- CMVPs are derived as the accumulation of recursively traced MVs and BVs based on pre-derived merge candidates.
- Similar to EE2-1.8, traced MVs are found by checking five positions of CU.



- CMVPs are derived for each merge index, each list (i.e., L0 and L1), and each trace depth.
- The traceable reference pictures are only within RPL.
- CMVPs are inserted after HMVP for the regular merge and TM merge.
- hpellfidx, bcwldx, licFlag, and mhpFlag are not inherited.
- CMVPs are not derived when the TMVP is disabled.

■ Test 1: The length of the CMVP trace depth is 1 (i.e., $m = 1$), as like as EE2-2.1.8a

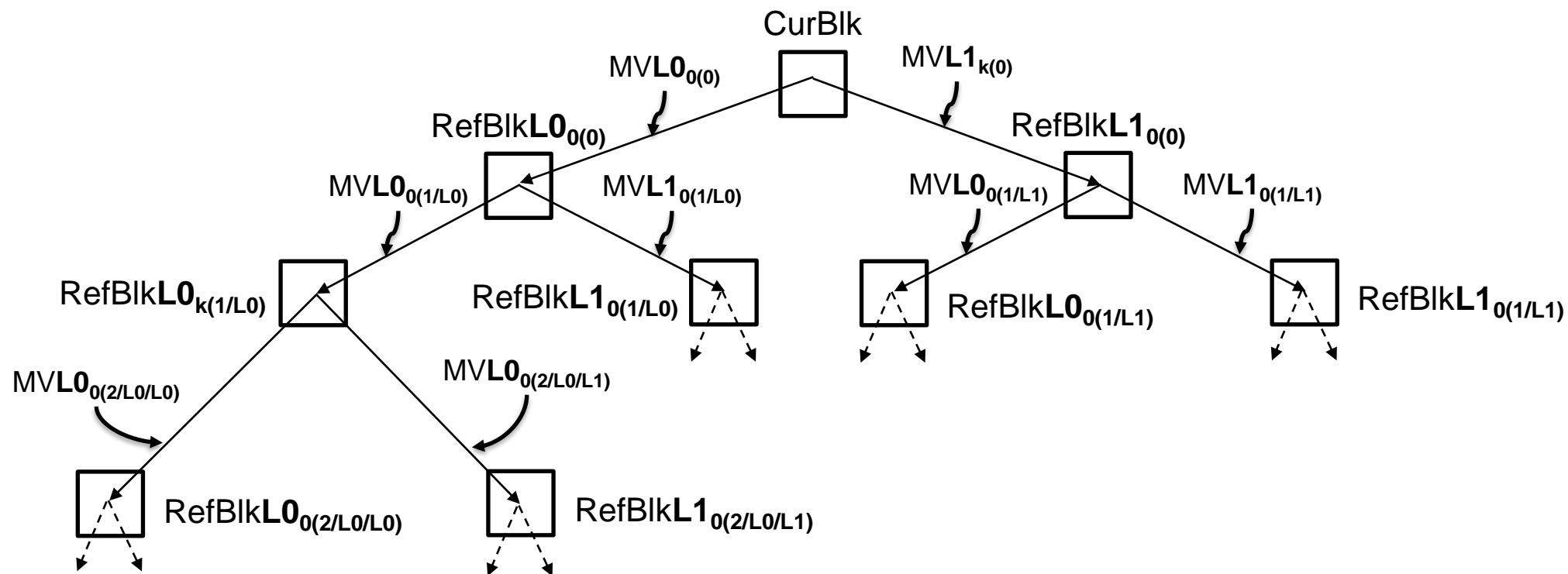
Class	RA					LDB					LDP				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
A1	-0.03%	-0.16%	-0.11%	99.8%	100.6%										
A2	-0.11%	-0.20%	-0.35%	99.8%	100.6%										
B	-0.12%	-0.27%	-0.34%	100.0%	100.4%	-0.25%	-0.21%	-0.07%	100.0%	101.5%	-0.28%	-0.37%	-0.60%	99.9%	100.8%
C	-0.13%	-0.15%	-0.25%	100.1%	100.5%	-0.37%	-0.04%	-0.67%	100.3%	102.4%	-0.32%	-0.03%	-0.26%	100.1%	102.4%
E						-0.78%	-0.37%	-0.28%	100.2%	102.9%	-0.24%	-1.18%	-0.82%	100.3%	102.4%
Overall	-0.10%	-0.20%	-0.27%	99.9%	100.5%	-0.42%	-0.20%	-0.32%	100.1%	102.1%	-0.28%	-0.46%	-0.54%	100.1%	101.7%
D	-0.09%	0.02%	-0.04%	100.1%	100.7%	-0.48%	-0.32%	-1.51%	99.6%	101.4%	-0.36%	-0.87%	0.20%	100.2%	101.3%
F	-0.05%	-0.06%	-0.11%	100.1%	101.1%	-0.96%	-0.69%	-0.76%	99.4%	104.5%	-0.29%	-0.19%	0.29%	99.8%	101.5%
TGM	-0.18%	-0.20%	-0.14%	100.1%	103.9%	-0.45%	-0.57%	-0.50%	100.1%	102.1%	-0.18%	-0.34%	-0.50%	100.3%	102.2%

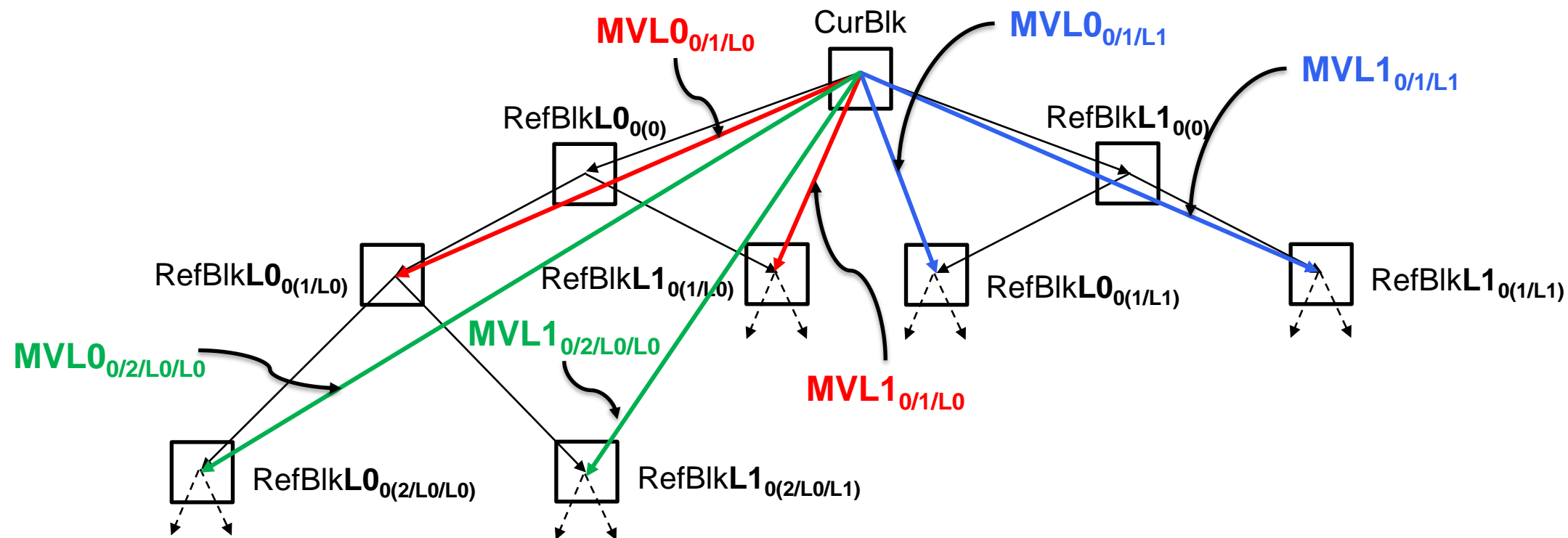
■ Test 2: No constraint for the length of the CMVP trace depth, as like as EE2-1.8c

Class	RA					LDB					LDP				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
A1	-0.06%	-0.30%	-0.14%	99.6%	100.8%										
A2	-0.08%	-0.17%	-0.28%	99.6%	100.8%										
B	-0.14%	-0.20%	-0.29%	99.8%	100.4%	-0.31%	0.05%	0.13%	100.0%	101.8%	-0.26%	-0.58%	-0.52%	100.0%	101.3%
C	-0.15%	-0.11%	-0.07%	99.9%	100.9%	-0.36%	-0.17%	-0.89%	100.2%	102.8%	-0.36%	-0.34%	-0.43%	100.3%	102.8%
E						-0.53%	-0.01%	0.33%	100.3%	103.4%	-0.22%	-0.29%	0.44%	100.1%	102.7%
Overall	-0.12%	-0.19%	-0.20%	99.7%	100.7%	-0.38%	-0.04%	-0.16%	100.1%	102.5%	-0.28%	-0.43%	-0.25%	100.1%	102.1%
D	-0.04%	-0.07%	-0.07%	100.1%	101.1%	-0.34%	-0.63%	-0.71%	99.6%	101.6%	-0.27%	-0.91%	-0.05%	100.6%	101.9%
F	-0.10%	-0.11%	-0.27%	100.0%	101.8%	-0.58%	-0.77%	-0.82%	99.5%	103.7%	-0.17%	-0.36%	-0.27%	99.9%	101.1%
TGM	-0.18%	-0.23%	-0.22%	100.0%	103.5%	-0.49%	-0.46%	-0.55%	99.9%	103.4%	-0.25%	-0.42%	-0.52%	100.2%	104.2%

- A chained motion vector prediction as new merge candidates is proposed.
- -0.42% gains on average over ECM-11.0 under LB is confirmed.
- DecT is slightly increased (~2%).
- It is recommended to study the proposal in the next EE.

Thanks to Bytedance and InterDigital for crosscheck!
(JVET-AG0240 and JVET-AG0257)





Merge candidate list

merge_idx	List L0	List L1
0	MVL0 ₀	MVL1 ₀
1	MVL0 ₁	—
2	—	MVL1 ₂
...
k	MVL0 _{0/1/L0}	MVL1 _{0/1/L0}
k+1	MVL0 _{0/1/L1}	MVL1 _{0/1/L1}
k+2	MVL0 _{1/1/L0}	MVL1 _{1/1/L0}
k+3	MVL0 _{1/1/L1}	MVL1 _{1/1/L1}
...
n	MVL0 _{0/2/1/L0}	MVL1 _{0/2/1/L0}
...