

REDEFINING MOBILITY



JCT3V-E0124: Further improvements on advanced residual prediction

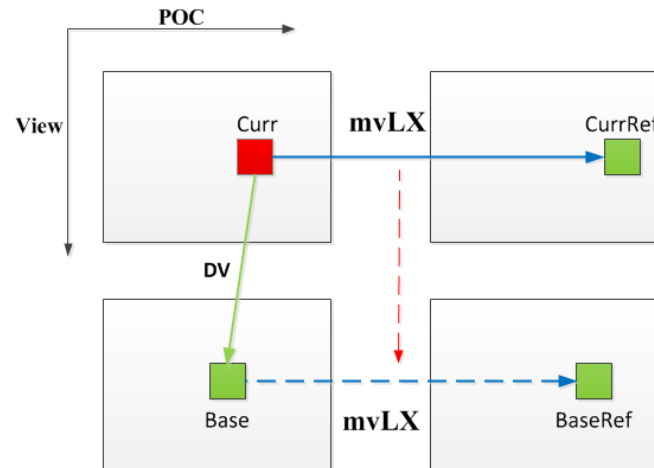
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Summary

- Three main aspects are proposed:
 - ARP is extended to inter-view residual
 - Disparity vector refinement for current ARP
 - Joint optimization of signaling illumination compensation flag and ARP weighting factors.
- Proposed method provides an improved coding gain of 0.6% and 0.5% for texture views and synthesized views, respectively.

Introduction

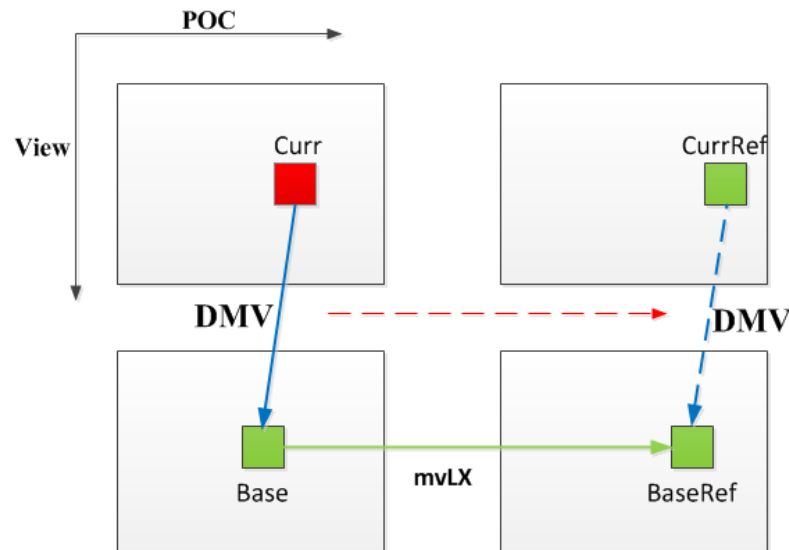
- Advanced residual prediction in 3D-HEVC
 - Applied to temporal residual with the disparity vector (DV) derived from NBDV
 - Residual predictor generation
 - The difference between two reference blocks in a reference view ($\text{Base} - \text{BaseRef}$)
 - Temporal motion vector of current block is inherited



- A weighting factor index is signaled in CU-level

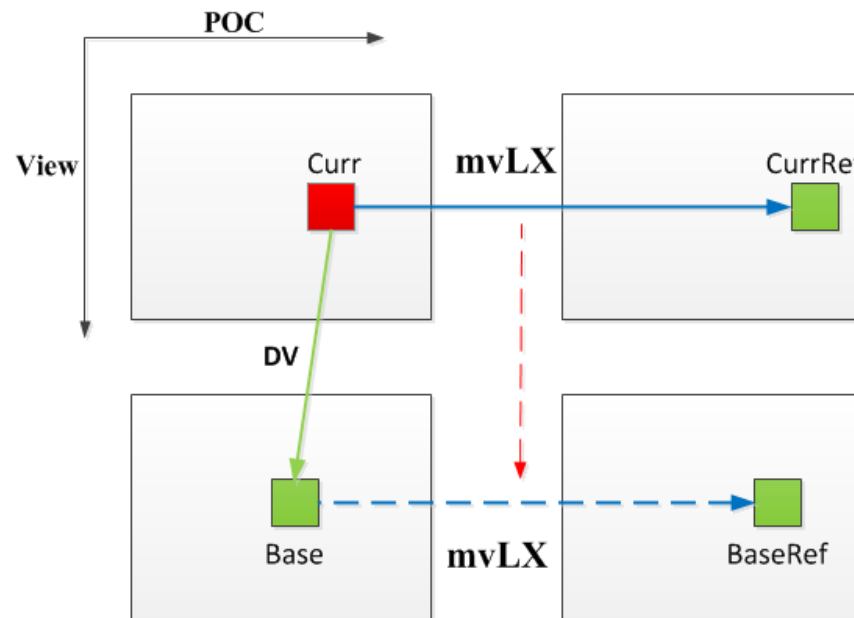
Proposed method #1

- ARP is extended to inter-view residual
 - Residual predictor generation
 - The difference between two reference blocks in a different access unit ($\text{CurrRef} - \text{BaseRef}$)
 - Disparity motion vector of current block is inherited
 - Temporal motion vector (mvLX) of the block covering the center position of Base is utilized.



Proposed method #2

- DV refinement for current ARP
 - The DV is replaced by a disparity motion vector (DMV) contained by the reference block for residual predictor generation.
 - Only the DMV of the block covering the center position of CurrRef is utilized.



Proposed method #3

- Joint optimization of IC and ARP weighting factor signaling
 - ic_flag is not signaled when ARP weighting factor is unequal to 0
 - ARP weighting factor is signaled even when both reference picture lists contain no temporal reference pictures

Proposed method #4

- More accurate motion vectors
 - One more block is checked in addition to the block covering the center position.
 - Block covering the bottom-right position of the reference block
 - Defined in a similar way as the temporal merging candidate

Experimental results

- Test conditions
 - CTC, HTM7.0r1
- Coding performance

Table 1: Coding gain w.r.t. anchor for 3-view case

	Video 1	Video 2	Video PSNR /video bitrate	Video PSNR /total bitrate	Synth PSNR /total bitrate
Test #1 (Full proposal)	-1.7%	-1.6%	-0.6%	-0.6%	-0.5%
Test #2 (ARP for inter-view residual)	-0.8%	-0.9%	-0.3%	-0.3%	-0.2%
Test #3 (DV refinement)	-0.3%	-0.3%	-0.1%	-0.1%	-0.1%
Test #4 (#2+ #3 + signaling opt.)	-1.5%	-1.5%	-0.6%	-0.5%	-0.4%

- Running time
 - Almost the same as HTM anchor
- Thanks to MERL, HHI and MTK for the crosscheck!
(JCT3V-E0247/E0290/E0244)

Conclusions

- The proposed scheme further improves the performance of ARP by:
 - Enabling it for inter-view residual
 - Refined DV
 - A better way to signal weighting factors and ic_flag
- Main results
 - The coding efficiency is improved by 0.6% for texture views
 - Running time is almost the same

Thank you!