

JCT3V-I0112

Simplification for VSP-related Merge Candidate List Construction

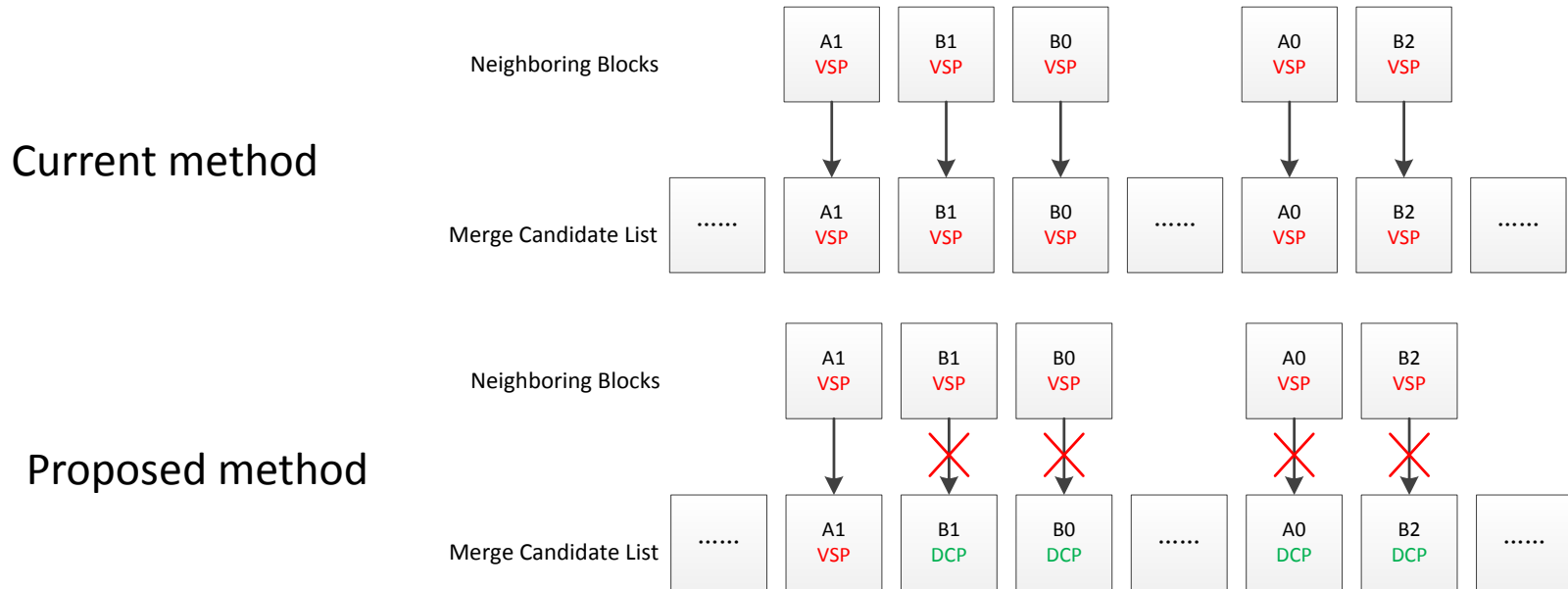
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Introduction

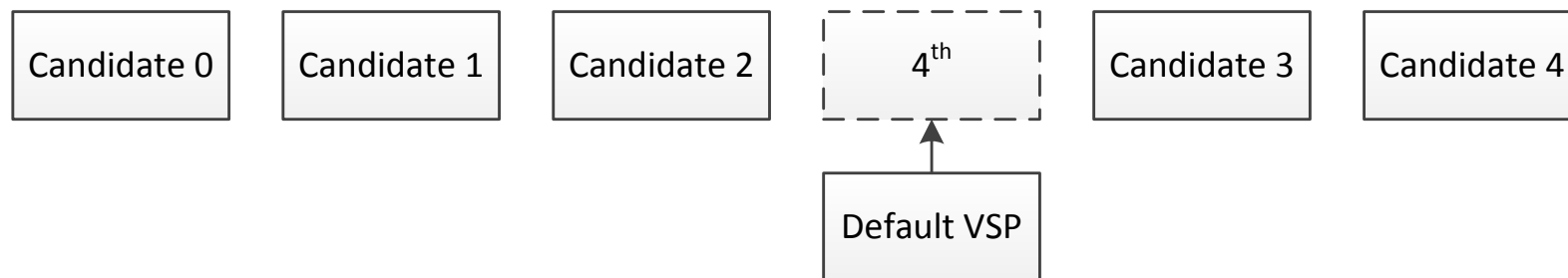
- VSP Candidate Inheritance
 - VSP candidates are inherited from spatial neighboring blocks of current PU and multiple VSP-coded neighboring blocks results in multiple VSP candidates in MCL
- Virtual Depth Block Fetching
 - Unified DV (NBDV) for virtual depth block fetching to align with the one used for DoNBDV, to avoid multiple depth block fetches
- Multiple VSP candidates with same synthesis result
- Different DVs for virtual depth block fetching in previous design of 3D-HEVC
- Additional conditional checking for VSP flags of spatial neighboring blocks and storage for VSP flags
- Requires dependency between HEVC & 3D-HEVC list

Proposed Method



- VSP inheritance simplification
 - Only VSP flag of block A1 is inherited while other VSP-coded neighboring blocks are inherited as DCP candidate.
- Reduced number of VSP flags checking
- Reduced VSP flags storage
- No CTU-boundary checking for VSP inheritance

Proposed Method



- Put the default VSP candidate in a fixed position in MCL only when A1 is not VSP-coded
 - The position of default VSP candidate is relatively higher than the default VSP candidate in current design in most cases, thus reduce the cost of coding merge_index for VSP mode
 - There would be at most only one VSP candidate exists in MCL
 - No redundant VSP candidate

Complexity reduction

	Current 3D-HEVC	Proposed
VSP flag checking of spatial neighboring blocks	5	1
CTU line checking	3	0

VSP flags are no longer inherited from upper neighboring blocks, so no CTU boundary checking is required

Experimental results

- Proposed method vs Anchor (HTM11)

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time
Balloons	0.00%	0.03%	0.09%	0.01%	0.00%	-0.05%	99.0%	96.1%
Kendo	0.00%	-0.06%	-0.08%	-0.04%	-0.08%	-0.05%	96.1%	98.1%
Newspaper_CC	0.00%	-0.05%	0.12%	0.00%	0.00%	0.07%	95.9%	101.0%
GT_Fly	0.00%	-0.38%	-0.18%	-0.07%	-0.08%	-0.06%	97.4%	102.7%
Poznan_Hall2	0.00%	0.09%	-0.04%	0.02%	0.04%	0.02%	99.0%	98.2%
Poznan_Street	0.00%	0.02%	-0.02%	-0.02%	-0.03%	-0.01%	97.1%	100.3%
Undo_Dancer	0.00%	-0.14%	-0.04%	-0.04%	-0.04%	0.01%	96.0%	100.4%
Shark	0.00%	-0.18%	-0.12%	-0.06%	-0.06%	-0.01%	98.9%	101.5%
1024x768	0.00%	-0.03%	0.04%	-0.01%	-0.03%	-0.01%	97.0%	98.4%
1920x1088	0.00%	-0.12%	-0.08%	-0.04%	-0.03%	-0.01%	97.7%	100.6%
average	0.00%	-0.08%	-0.03%	-0.03%	-0.03%	-0.01%	97.4%	99.8%

Conclusion

- The proposed method simplifies the VSP candidate construction process of merge candidate list.
- Provides coding on sequences with better depth map.
- The maximum coding gain on dependent view is 0.38%.
- Recommend to adopt to 3D-HEVC and HTM.

Thanks ZTE (I0136) for
cross-checking this proposal