

REDEFINING MOBILITY



JCT3V-D0178: CE5.h: Merge candidates derivation from vector shifting

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Summary

- This is a harmonized follow-up of proposals JCT3V-C0045 and JCT3V-C0148
 - Two candidates are derived and inserted into the candidate list
 - Each candidate is derived from the shifted disparity vector or from the shifted disparity motion vector of spatial neighbors

- Proposed method provides an improved coding gain of 0.2% regardless of BVSP on or off, respectively.

Introduction

- Merge candidate list construction in 3D-HEVC
 - Candidate derived from inter-view motion prediction
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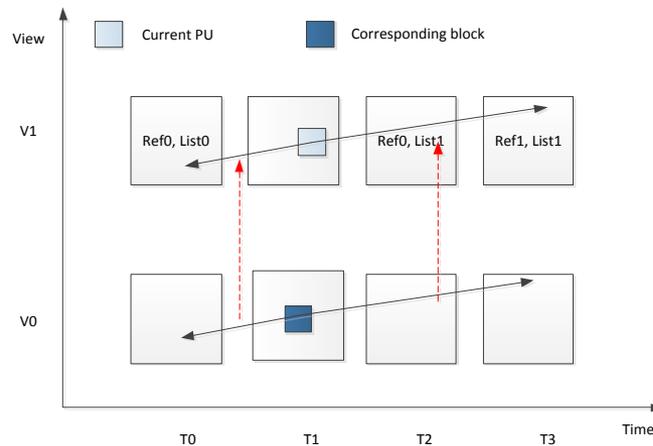


Figure 1. Derivation of inter-view predicted motion candidate for merge mode

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 - Spatial merging candidates (SCs)
 - Disparity motion vector candidate converted from the disparity vector (DV)
 - BVSP merging candidate
 - Other merging candidates
 - Temporal merging candidate
 - Combined bi-predictive merging candidates
 - Zero motion vector merging candidates

Proposed method

- Two additional (left/right) candidates are added into the merge candidate list
- Left/right candidates
 - IPMC is derived with the DV horizontally added by $-4/4$
 - If IPMC is unavailable, DSMV is generated as follows
 - Find the first available spatial neighbor that has disparity motion vector (DMV) in list 0
 - » If available, DSMV is generated by horizontally adding the DMV by $-4/4$
 - » When BVSP is enabled, vertical component of DSMV is set to 0
 - Otherwise, DSMV is generated by horizontally adding the DV by $-4/4$
- The left/right candidates are inserted right before and after temporal candidate after limited pruning
 - Left/right candidate is only compared to IPMC derived from DV if it is an IPMC

Experimental results

- Platform: HTM 6.0
- Test conditions: CTC

Table 1: Coding gain w.r.t. anchor for 3-view case (in CTC)

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time	ren time
Balloons	0.0%	-0.2%	-0.3%	-0.1%	-0.1%	-0.2%	117.3%	100.6%	107.7%
Kendo	0.0%	-0.2%	-0.1%	-0.1%	-0.1%	0.0%	115.5%	100.2%	109.0%
Newspaper_CC	0.0%	-0.5%	-0.1%	-0.1%	-0.1%	-0.1%	117.1%	100.3%	108.3%
GT_Fly	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	117.5%	100.3%	104.9%
Poznan_Hall2	0.0%	-0.6%	-0.7%	-0.3%	-0.3%	-0.2%	119.5%	100.2%	108.8%
Poznan_Street	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	117.7%	100.2%	107.2%
Undo_Dancer	0.0%	-0.1%	-0.2%	-0.1%	0.0%	-0.5%	118.5%	100.1%	108.9%
1024x768	0.0%	-0.3%	-0.2%	-0.1%	-0.1%	-0.1%	116.6%	100.4%	108.3%
1920x1088	0.0%	-0.1%	-0.2%	-0.1%	-0.1%	-0.2%	118.3%	100.2%	107.5%
average	0.0%	-0.2%	-0.2%	-0.1%	-0.1%	-0.2%	117.6%	100.3%	107.8%

Experimental results

- Platform: HTM 6.0
- Test conditions: CTC with both BVSP & DoNBDV off

Table 2: Coding gain w.r.t. anchor for 3-view case (BVSP off)

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time	ren time
Balloons	0.0%	-0.2%	-0.2%	-0.1%	-0.1%	-0.1%	101.3%	99.1%	96.6%
Kendo	0.0%	-0.4%	-0.5%	-0.2%	-0.2%	-0.2%	102.4%	99.2%	104.3%
Newspaper_CC	0.0%	-0.6%	-0.4%	-0.2%	-0.2%	-0.2%	102.3%	98.6%	103.6%
GT_Fly	0.0%	-0.6%	-0.6%	-0.2%	-0.2%	-0.2%	100.1%	99.1%	101.2%
Poznan_Hall2	0.0%	-0.6%	-0.8%	-0.3%	-0.3%	-0.2%	101.0%	99.1%	97.4%
Poznan_Street	0.0%	-0.2%	-0.2%	-0.1%	-0.1%	-0.1%	101.0%	99.1%	96.9%
Undo_Dancer	0.0%	-0.4%	-0.3%	-0.1%	-0.1%	-0.2%	100.1%	99.7%	98.7%
1024x768	0.0%	-0.4%	-0.4%	-0.2%	-0.2%	-0.2%	102.0%	99.0%	101.5%
1920x1088	0.0%	-0.5%	-0.5%	-0.2%	-0.2%	-0.2%	100.6%	99.2%	98.5%
average	0.0%	-0.4%	-0.4%	-0.2%	-0.2%	-0.2%	101.2%	99.1%	99.8%

- Thanks to the MediaTek for the cross-check (JCT3V-D0261)

Conclusions

- In the proposed method
 - Two candidates are generated with the shifted DV or with the shifted DMV of the spatial neighbors
 - The coding efficiency is improved by 0.2% in the BVSP on and off cases.

Thank you!