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REDEFINING MOBILITY

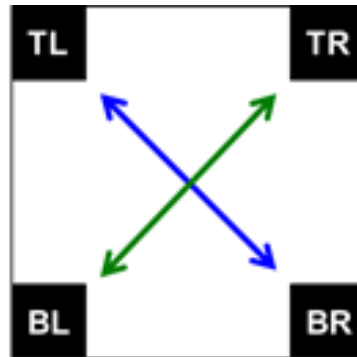# JCT3V-F0130: BVSP for asymmetric motion partitioning

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Summary

- Two aspects are proposed for uni-predictive BVSP mode.
    - When the current PU size is 16x12 (or 12x16), it is split to two 8x8 blocks in raster scan order and two remaining 4x8 or 8x4 blocks. However, for the remaining 4x8 or 8x4 blocks, the motion compensation size is directly set equal to the block size.
    - When the current PU size is 16x4 (or 4x16) and the PU is uni-directional predicted, the motion compensation size is set to 8x4 (or 4x8).

- Proposed method provides minor coding loss and coding gain for the two aspects, respectively.
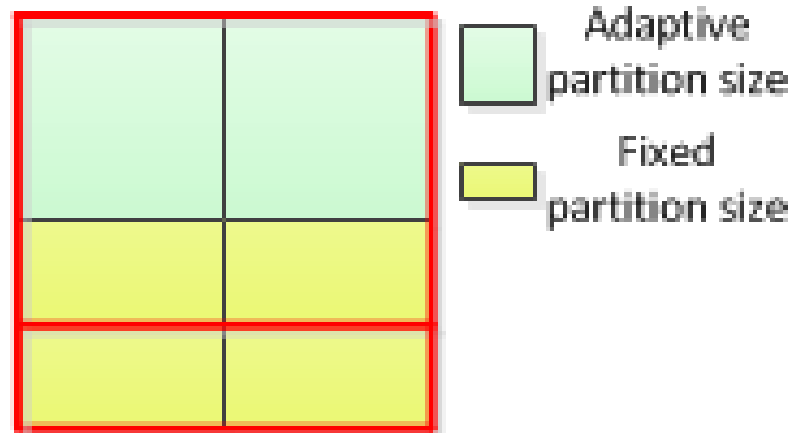
Introduction

- Adaptive block partitioning for BVSP was adopted [1]

  - For the BVSP coded prediction units (PUs), it is firstly split into several 8x8 blocks.

  - For each 8x8 block, either 4x8 or 8x4 partition for motion compensation is selected by analyzing depth values at 4 corners of one corresponding 8x8 depth block.

- Problems

  - When the current PU size is 12x16 or 16x12, the motion compensation size may be equal to 4x4 which is not allowed by HEVC.

  - When the current PU size is 4x16 or 16x4, BVSP is achieved by deriving one disparity vector for the whole PU. Using larger block size may make the BVSP less efficient.

Proposed methods

- When the current PU size is 16x12 (or 12x16), the following apply:
    - It is still firstly split to two 8x8 blocks and two remaining 4x8 or 8x4 blocks.
    - For each 8x8 block, adaptive partition size is applied.
    - For the remaining 4x8 or 8x4 blocks, the motion compensation size is directly set equal to the block size.

- When the current PU size is 16x4 (or 4x16), the motion compensation size is set to 8x4 (or 4x8).
    - The motion compensation size for BVSP coded PUs could be aligned and potential coding gain may be expected.

Adaptive partition size

Fixed partition size

Experimental results

- Test conditions
  - CTC, HTM 8.0
- Coding performance of the first aspect

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
Balloons	0.09%	-0.09%	0.00%	-0.01%	0.05%
Kendo	-0.03%	0.02%	0.00%	0.00%	0.01%
Newspapercc	0.10%	0.09%	0.04%	0.04%	0.05%
GhostTownFly	0.09%	-0.07%	0.00%	0.00%	0.05%
PoznanHall2	0.06%	-0.03%	0.01%	0.01%	-0.03%
PoznanStreet	0.10%	0.05%	0.02%	0.01%	-0.02%
UndoDancer	0.08%	-0.06%	0.01%	0.01%	-0.02%
1024x768	0.05%	0.01%	0.01%	0.01%	0.04%
1920x1088	0.08%	-0.03%	0.01%	0.01%	-0.01%
average	**0.07%**	**-0.01%**	**0.01%**	**0.01%**	**0.01%**
Shark	*0.07%*	*0.06%*	*0.01%*	*0.01%*	*0.00%*

Experimental results

- Test conditions
  - CTC, HTM 8.0
- Coding performance of the second aspect

Table 2: 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
Balloons	-0.07%	-0.19%	-0.05%	-0.05%	-0.02%
Kendo	0.10%	-0.02%	0.02%	0.01%	-0.04%
Newspapercc	-0.02%	0.03%	0.00%	0.00%	-0.03%
GhostTownFly	-0.02%	-0.06%	-0.01%	-0.02%	-0.04%
PoznanHall2	0.03%	-0.09%	-0.02%	0.00%	-0.09%
PoznanStreet	0.14%	-0.03%	0.02%	0.01%	-0.02%
UndoDancer	0.09%	-0.13%	0.00%	0.00%	-0.01%
1024x768	0.01%	-0.06%	-0.01%	-0.01%	-0.03%
1920x1088	0.06%	-0.08%	0.00%	0.00%	-0.04%
average	**0.04%**	**-0.07%**	**-0.01%**	**-0.01%**	**-0.03%**
Shark	*-0.06%*	*0.10%*	*0.00%*	*0.00%*	*0.01%*

Experimental results

- Test conditions
  - CTC, HTM 8.0

- Coding performance of the whole proposal

Table 3: 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
Balloons	0.01%	-0.05%	-0.01%	0.01%	0.03%
Kendo	0.02%	-0.03%	0.00%	0.00%	-0.04%
Newspapercc	0.05%	0.06%	0.01%	0.01%	0.02%
GhostTownFly	0.11%	-0.16%	-0.02%	-0.02%	-0.02%
PoznanHall2	0.06%	-0.18%	-0.03%	-0.02%	-0.10%
PoznanStreet	0.04%	-0.03%	0.00%	-0.01%	-0.02%
UndoDancer	0.12%	-0.17%	0.00%	0.00%	0.00%
1024x768	0.03%	-0.01%	0.00%	0.01%	0.01%
1920x1088	0.08%	-0.13%	-0.01%	-0.01%	-0.03%
average	0.06%	-0.08%	-0.01%	0.00%	-0.02%
Shark	*-0.03%*	*0.11%*	*0.00%*	*0.00%*	*0.03%*

- Thanks to NTT for the crosscheck! (JCT3V-F0181)

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Thank you!