

REDEFINING MOBILITY

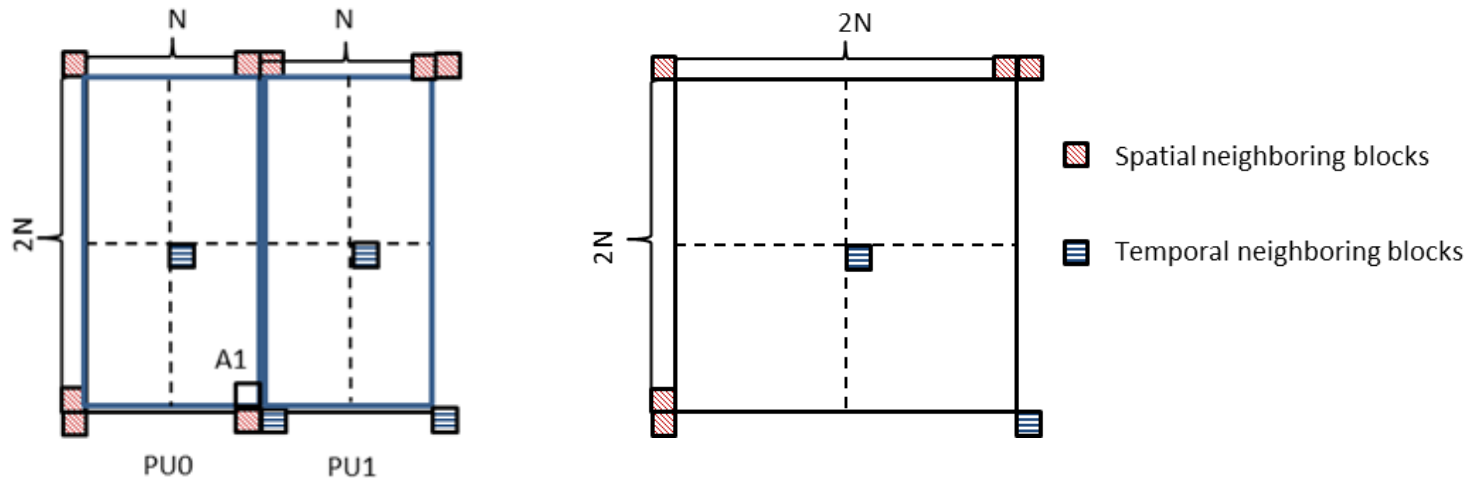


# JCT3V-D0181: CE2.h related: CU-based Disparity Vector Derivation

Jewon Kang, Ying Chen, Li Zhang, and Marta Karczewicz

# Introduction

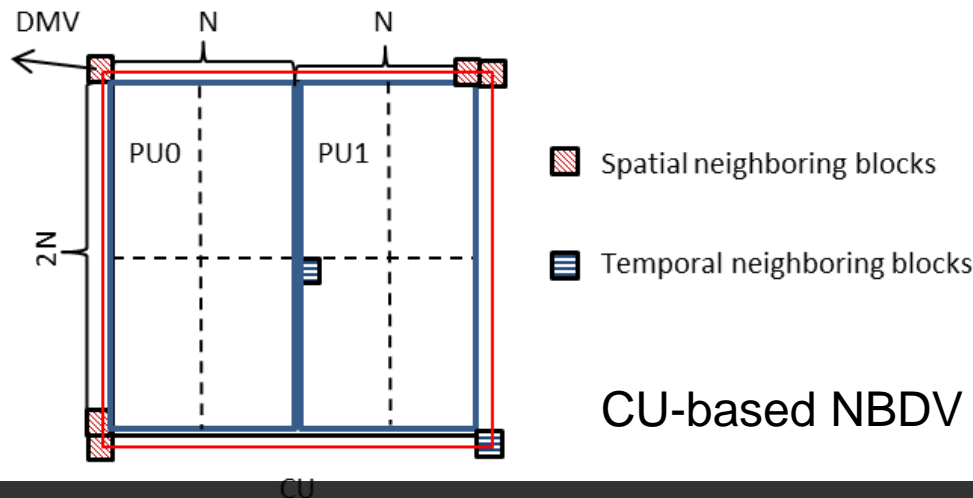
- PU-based disparity vector derivation in the current design
  - Search out a disparity motion vector from pre-defined spatially and temporally neighboring blocks, and derived disparity vectors in DV-MCP block (the same position of spatial blocks).
  - If found, the NBDV process is terminated, and the DV is refined using depth information.



Spatial and temporal neighboring block positions in  $N \times 2N$  partition (the left) and  $2N \times 2N$  partition (the right) in PU-based NBDV

# Proposed CU-based DV Derivation

- One time DV derivation for a CU in decoder/encoder, and the DV is shared with all the PU therein.
  - Complexity reduction: the worst number of the DV derivation (e.g. 4x8 or 8x4 PU in CTC) is reduced.
  - Parallelizable feature: no condition check about a PU shape and a PU index.
  - Other aspects (e.g. block positions, checking order, etc.) are not changed.



CU-based NBDV derivation

# Experimental Results

- CU-based DV derivation VS the anchor
  - Test conditions: CTC (Crosscheck results in JCT3V-D0131 & JCT3V-D0250)

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time
Balloons	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	100.4%	99.5%
Kendo	0.0%	0.2%	-0.1%	0.0%	0.0%	0.0%	102.2%	98.0%
Newspaper_CC	0.0%	-0.2%	0.0%	0.0%	0.0%	0.0%	96.6%	97.2%
GT_Fly	0.0%	-0.1%	0.2%	0.0%	0.0%	0.0%	97.4%	101.3%
Poznan_Hall2	0.0%	-0.5%	-0.2%	-0.2%	-0.2%	-0.2%	102.9%	102.0%
Poznan_Street	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	96.5%	97.9%
Undo_Dancer	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	98.9%	101.0%
1024x768	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.7%	98.3%
1920x1088	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	98.9%	100.5%
<b>average</b>	<b>0.0%</b>	<b>-0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>99.3%</b>	<b>99.6%</b>

# Experimental Results

- CU-based DV derivation VS the anchor
  - Test conditions: CTC with DoNBDV and BVSP off (Crosscheck results in JCT3V-D0250)

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time
Balloons	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	101.6%	99.5%
Kendo	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	99.4%	105.2%
Newspaper_CC	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.9%	106.3%
GT_Fly	0.0%	0.1%	-0.1%	0.0%	0.0%	0.0%	97.8%	92.6%
Poznan_Hall2	0.0%	-0.1%	-0.2%	0.0%	0.0%	0.0%	105.5%	101.0%
Poznan_Street	0.0%	0.2%	-0.1%	0.0%	0.0%	0.0%	98.6%	91.9%
Undo_Dancer	0.0%	0.2%	0.2%	0.1%	0.1%	0.1%	96.5%	100.4%
1024x768	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%	103.6%
1920x1088	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	99.6%	96.5%
<b>average</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>99.6%</b>	<b>99.5%</b>

# Conclusion

- The CU-based DV derivation proposal with a less complex DV derivation in the 3D-HEVC
  - Reduce the worst number of DV derivation, and, accordingly, the reduced number of block checking.
  - Easily provide a parallelizable property in the DV derivation.
  - No coding loss

# Thank you!

Special thank you Sharp&Samsung  
for cross-checking