

JCT3V-D0168

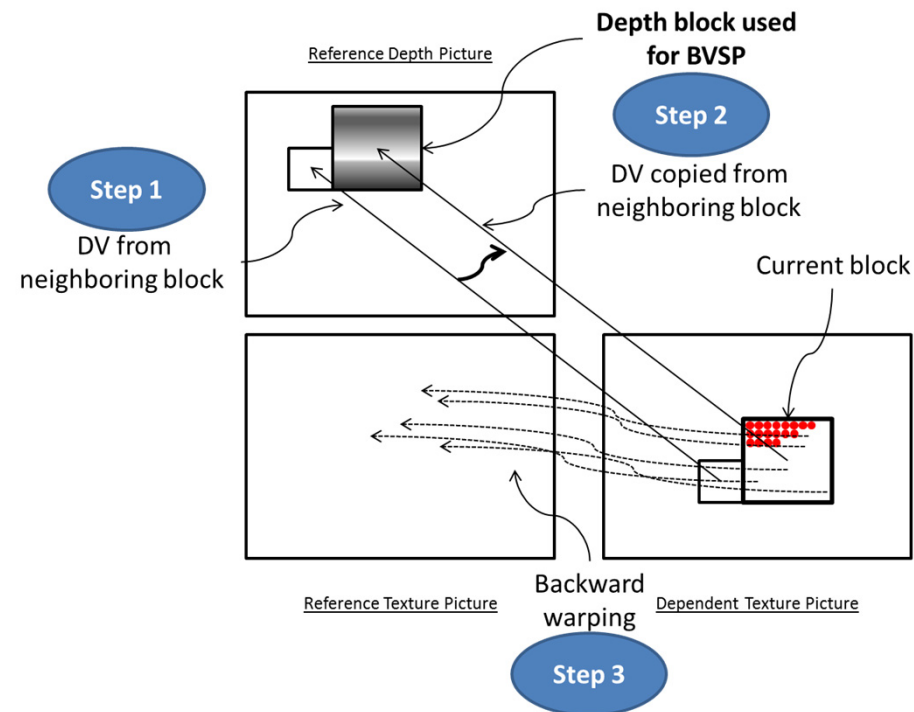
Forward Block-based View Synthesis Prediction (FVSP)

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Introduction

- Current VSP design in HTM:
 - Corresponding depth block retrieved by DoNBDV



Summary

- Block-based VSP using forward warping method FVSP:
 - Proposed in JCT3V-C0087 in Geneva
 - Reference block estimated without NBDV
 - Reference block warped to current view using forward warping method

FVSP - Description

- Depth retrieving is not dependent on neighboring blocks. The required reference texture/depth block in base view is estimated by base view depth map.
 - VSP module can always get a accurate reference block no matter the DVs of neighboring blocks are available or not
- The forward warping method is similar to that used in VSRS-1D-Fast in current HTM
 - No z-buffering is needed
 - Interpolation operations are conducted at most once for every warped pixel

Performance Analysis

Percentage of pixels using VSP modes:

	Anchor(BVSP)	FVSP	FVSP – Anchor	Synth PSNR/ Total bitrate
Balloons	0.54%	0.64%	0.10%	-0.2%
Kendo	0.97%	1.10%	0.13%	-0.1%
Newspaper	0.19%	0.27%	0.08%	-0.2%
GT_Fly	10.43%	10.66%	0.23%	-0.4%
Poznan_Hall2	0.78%	0.90%	0.12%	-0.2%
Poznan_Street	1.09%	1.17%	0.08%	-0.2%
Undo_Dancer	5.18%	7.30%	2.12%	-2.2%
Average	2.74%	3.15%	0.41%	-0.5%

Experimental results

- FVSP vs Anchor

	Video 0	Video 1	Video 2	Video PSNR / Video bitrate	Video PSNR / Total bitrate	Synth PSNR / Total bitrate	Encoding Time	Decoding Time
Balloons	0.0%	-0.6%	-0.2%	-0.1%	-0.2%	-0.2%	93.1%	98.9%
Kendo	0.0%	-0.2%	-0.1%	-0.1%	-0.1%	-0.1%	88.4%	97.0%
Newspaper_CC	0.0%	-0.3%	-0.2%	-0.1%	-0.1%	-0.2%	95.9%	101.1%
GT_Fly	0.0%	-1.1%	-1.3%	-0.3%	-0.4%	-0.4%	97.6%	98.0%
Poznan_Hall2	0.0%	-0.6%	-0.5%	-0.2%	-0.3%	-0.2%	135.1%	98.6%
Poznan_Street	0.0%	-0.5%	-0.2%	-0.1%	-0.1%	-0.2%	123.2%	95.2%
Undo_Dancer	0.0%	-6.2%	-6.6%	-1.8%	-1.9%	-2.2%	93.3%	98.0%
1024x768	0.0%	-0.4%	-0.2%	-0.1%	-0.1%	-0.2%	92.5%	99.0%
1920x1088	0.0%	-2.1%	-2.1%	-0.6%	-0.7%	-0.7%	112.3%	97.4%
average	0.0%	-1.4%	-1.3%	-0.4%	-0.4%	-0.5%	103.8%	98.1%

Conclusion

- FVSP achieves -0.5% BDrate gain vs HTM6.0.
- More pixels are coded by VSP mode.
- Decoding time of FVSP is similar to that of BVSP in Anchor.