

JCT3V-F0173

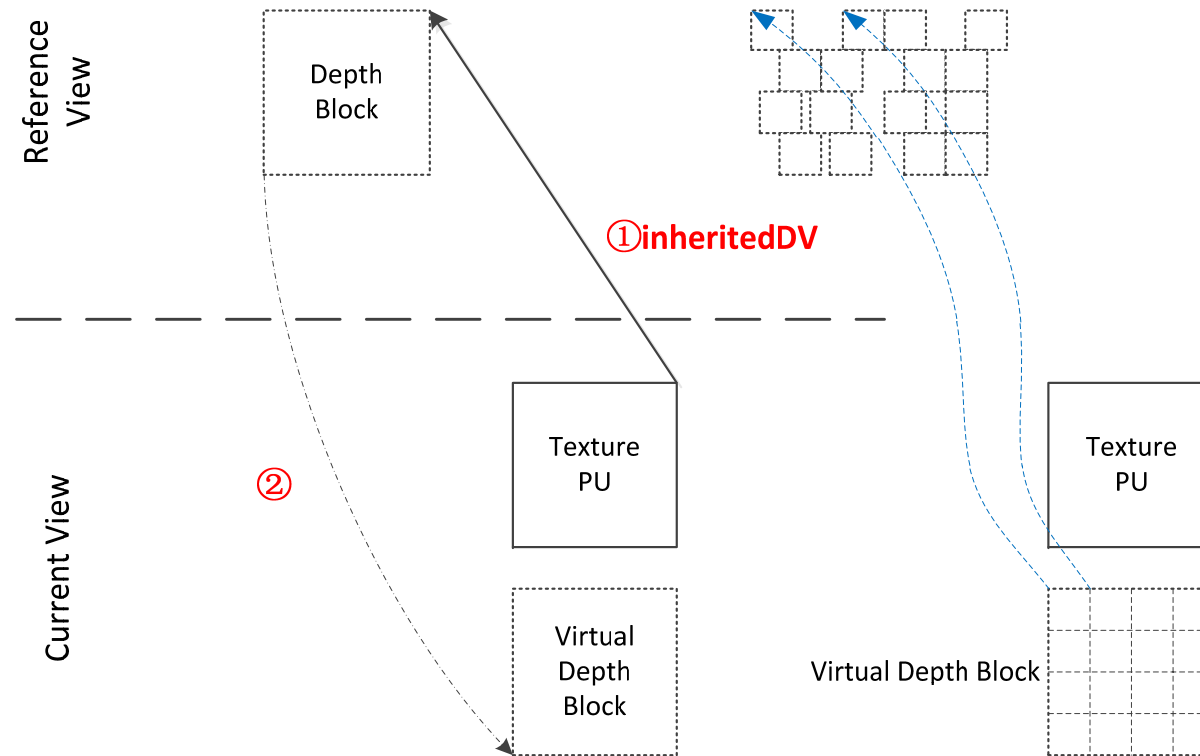
View Synthesis Prediction with DV difference

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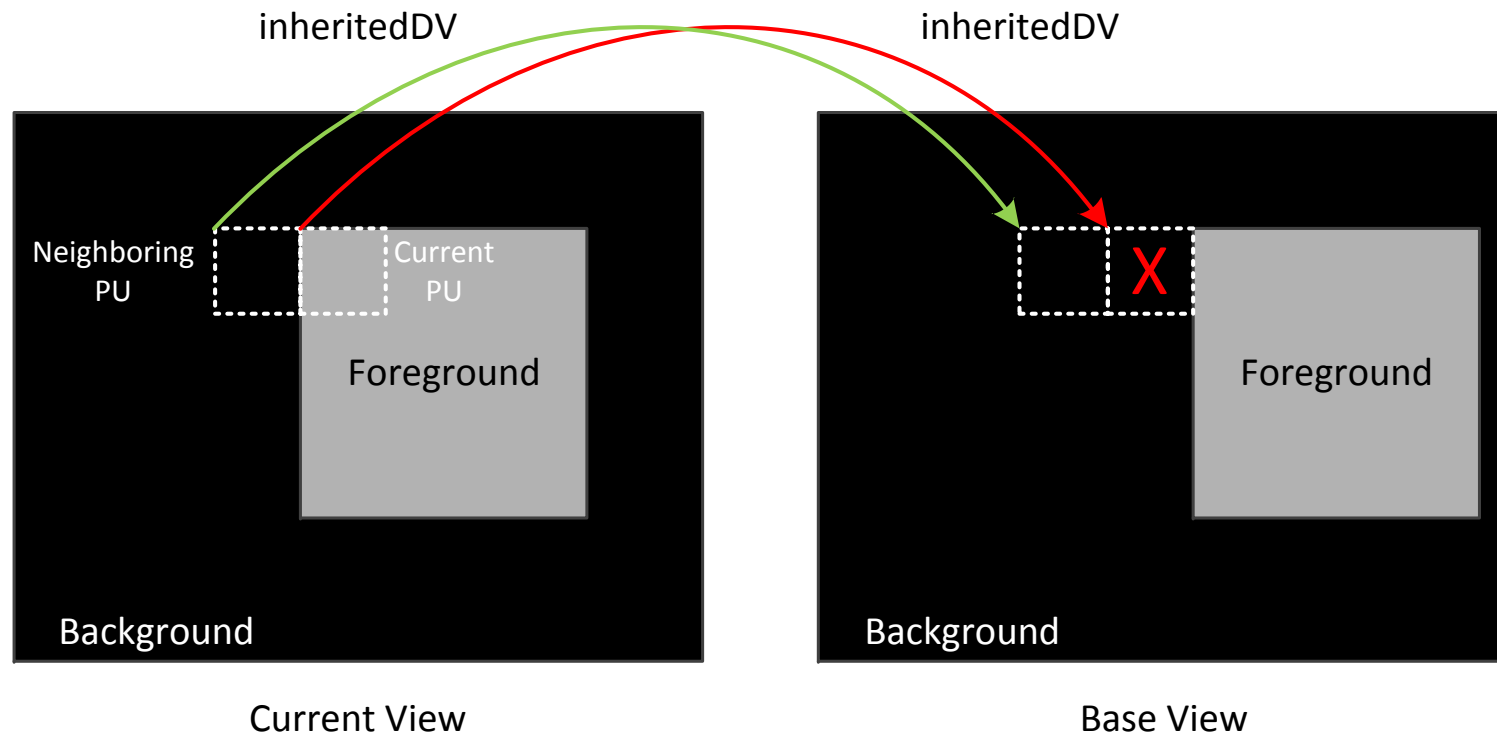
Introduction



$$V_{spDV} = \text{inheritedDV}$$

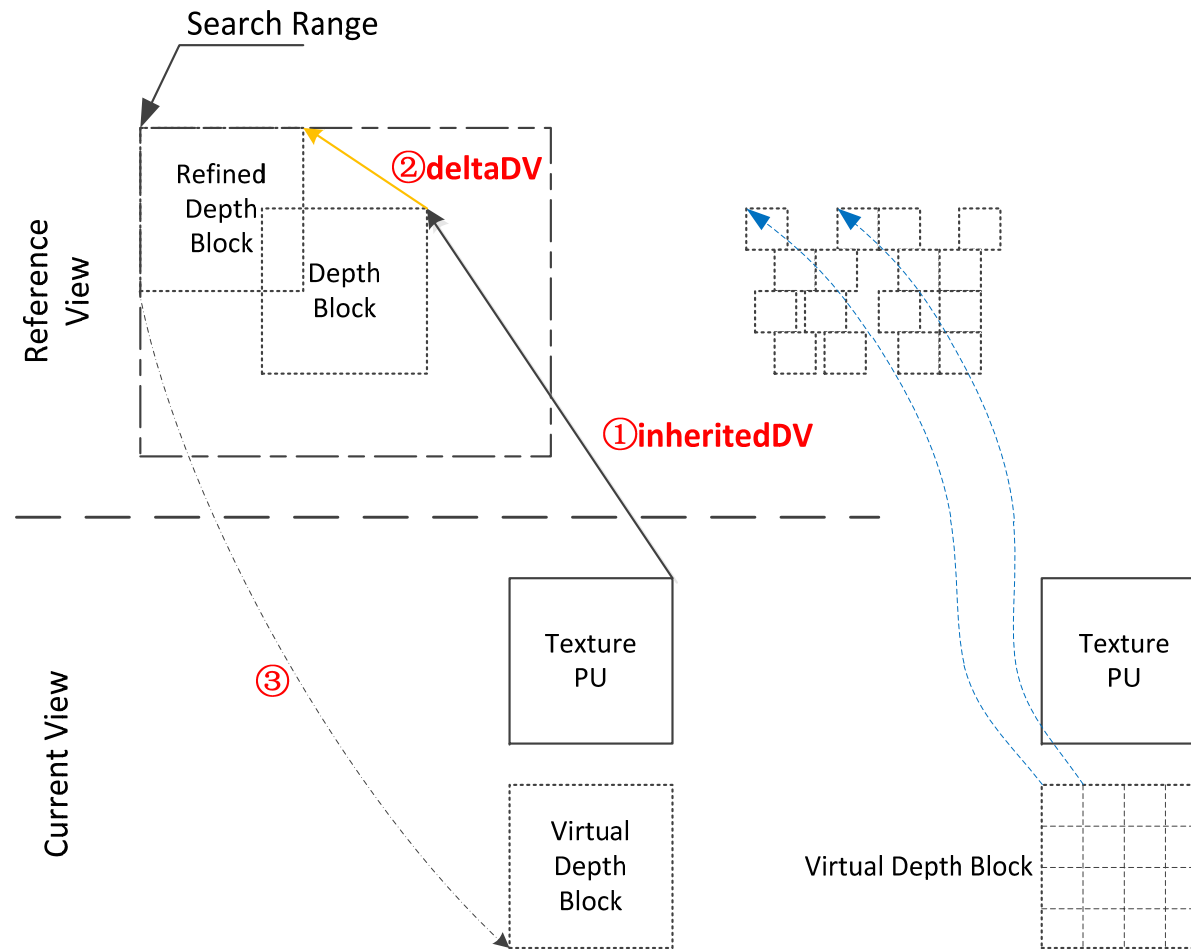
- Virtual depth block is located by the DV inherited from neighboring blocks of current texture PU.
- Then virtual depth block is used for disparity conversion.

Problem

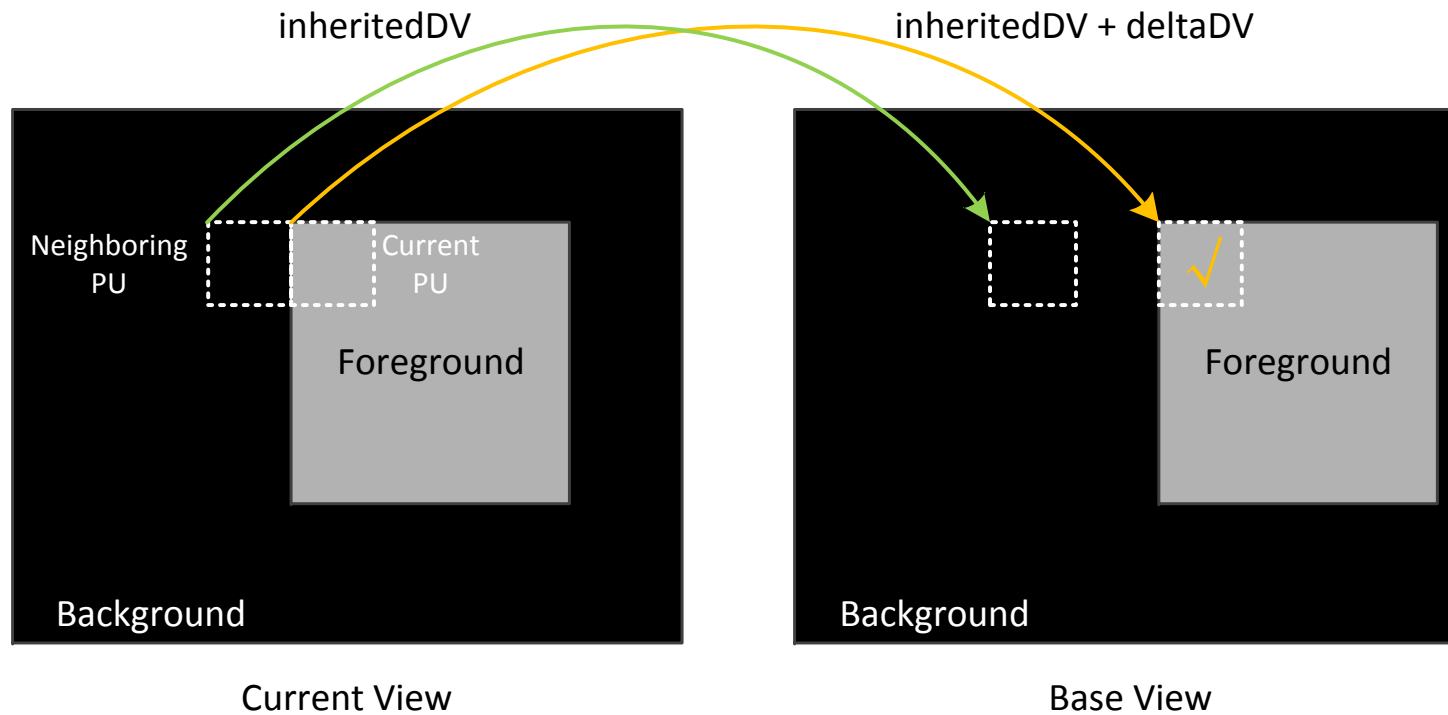


- A foreground PU with background neighboring PU.
- The inherited DV might results in wrong virtual depth block.
 - A foreground PU might get a background virtual depth block.
 - Bad synthesis quality → low prediction efficiency

Proposed method



Proposed Method



$$\text{VspDV} = \text{inheritedDV} + \text{deltaDV}$$

- The VspDV is now corrected by the deltaDV.
- The virtual depth block is now located at the foreground object.

Proposed Method

```
prediction_unit( x0, y0, nPbW, nPbH ) {  
    if( skip_flag[ x0 ][ y0 ] ) {  
        if( MaxNumMergeCand > 1 )  
            merge_idx[ x0 ][ y0 ]  
    } else { /* MODE_INTER */  
        merge_flag[ x0 ][ y0 ]  
        if( merge_flag[ x0 ][ y0 ] ) {  
            if( MaxNumMergeCand > 1 )  
                merge_idx[ x0 ][ y0 ]  
            if( view_synthesis_pred_flag[ layerId ] && nPbW > 8 && nPbH > 8 ){  
                delta_vsp_flag[x0][y0]  
                if(delta_vsp_flag[x0][y0])  
                    dvd_coding( x0, y0)  
            }  
        } else {  
            .....  
        }  
    }  
}
```

Experimental results

- Proposed method vs Anchor (HTM-8.0)

	Video 0	Video 1	Video 2	Video PSNR / Video bitrate	Video PSNR / Total bitrate	Synth PSNR / Total bitrate	Encoding Time	Decoding Time
Balloons	0.00%	0.00%	0.30%	0.10%	0.12%	0.05%	110.2%	101.2%
Kendo	0.00%	0.40%	0.45%	0.21%	0.20%	0.14%	111.6%	99.6%
Newspaper_CC	0.00%	0.30%	0.20%	0.12%	0.12%	0.05%	106.7%	98.5%
GT_Fly	0.00%	-0.24%	-0.15%	-0.03%	-0.03%	-0.01%	111.4%	101.1%
Poznan_Hall2	0.00%	0.13%	0.14%	0.09%	0.06%	-0.04%	111.0%	99.5%
Poznan_Street	0.00%	0.05%	0.01%	0.04%	0.02%	0.00%	111.1%	100.0%
Undo_Dancer	0.00%	-1.19%	-1.25%	-0.41%	-0.40%	-0.24%	113.8%	99.3%
1024x768	0.00%	0.23%	0.32%	0.15%	0.15%	0.08%	109.5%	99.8%
1920x1088	0.00%	-0.31%	-0.31%	-0.08%	-0.09%	-0.07%	111.8%	100.0%
average	0.00%	-0.08%	-0.04%	0.02%	0.01%	0.00%	110.8%	99.9%
Shark	0.00%	-0.30%	-0.29%	-0.06%	-0.07%	-0.03%	114.6%	99.9%

Conclusion

- A DV difference is introduced for VSP modes.
- Better virtual depth blocks are located by the newly introduced deltaDV.
- The maximum BD-rate savings of texture on dependent views is 1.2%.
- Better syntax design could achieve better performance.
- Suggest further study this in CE.

Thanks Huawei ([JCT3V-F0250](#)) for
cross-checking this proposal !!