

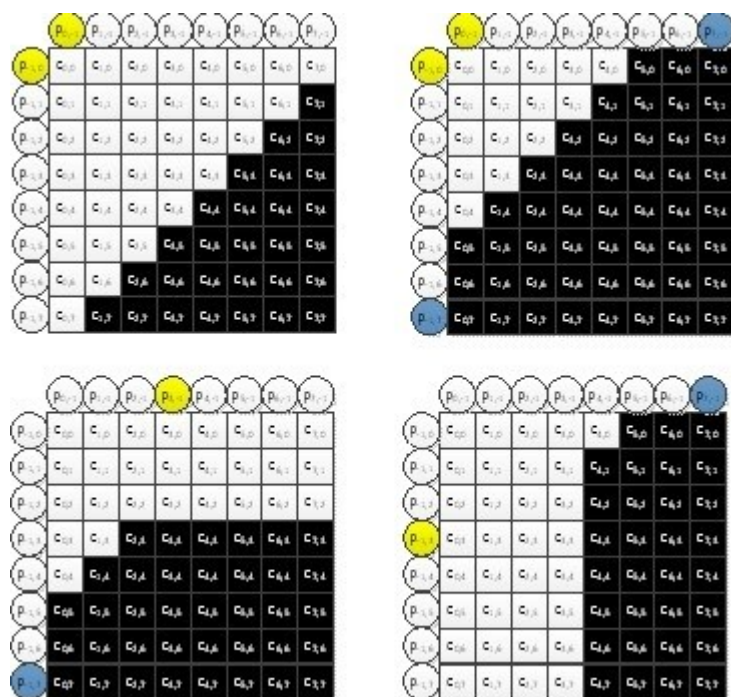
**JCT3V-H0108: Clean-up on DMM and SDC
DC value derivation
Xiaozhen Zheng**

Summary

- Motivation
 - ◆ Unify DC derivation for DMM1, DMM4, SDC DMM1 and SDC DMM4 modes
 - ◆ Simplify WD text and software implementation
- Experimental results
 - ◆ Same as htm10.0r1 anchor
- Cross-check: JCT3V-H0158 by HHI

Current DC derivation design

- DC derivation processes for DMM1, DMM4, SDC DMM1 and SDC DMM4 are different



DMM1 / DMM4: Check
neighboring samples

p0,0	p1,0	p2,0	p3,0	p4,0	p5,0	p6,0	p7,0
p0,1	p1,1	p2,1	p3,1	p4,1	p5,1	p6,1	p7,1
p0,2	p1,2	p2,2	p3,2	p4,2	p5,2	p6,2	p7,2
p0,3	p1,3	p2,3	p3,3	p4,3	p5,3	p6,3	p7,3
p0,4	p1,4	p2,4	p3,4	p4,4	p5,4	p6,4	p7,4
p0,5	p1,5	p2,5	p3,5	p4,5	p5,5	p6,5	p7,5
p0,6	p1,6	p2,6	p3,6	p4,6	p5,6	p6,6	p7,6
p0,7	p1,7	p2,7	p3,7	p4,7	p5,7	p6,7	p7,7

SDC DMM1: Check 4 corners
of prediction block

Current DC derivation design (2)

SDC DMM4: Check all of sample values of the prediction block to find two different values as DC predictors

```
for ( Int y = 0; y < uiSize; y++ )
{
    for ( Int x = 0; x < uiSize; x++ )
    {
        ucSegment = ptmpMask[x];
        assert( ucSegment < uiNumSegments );

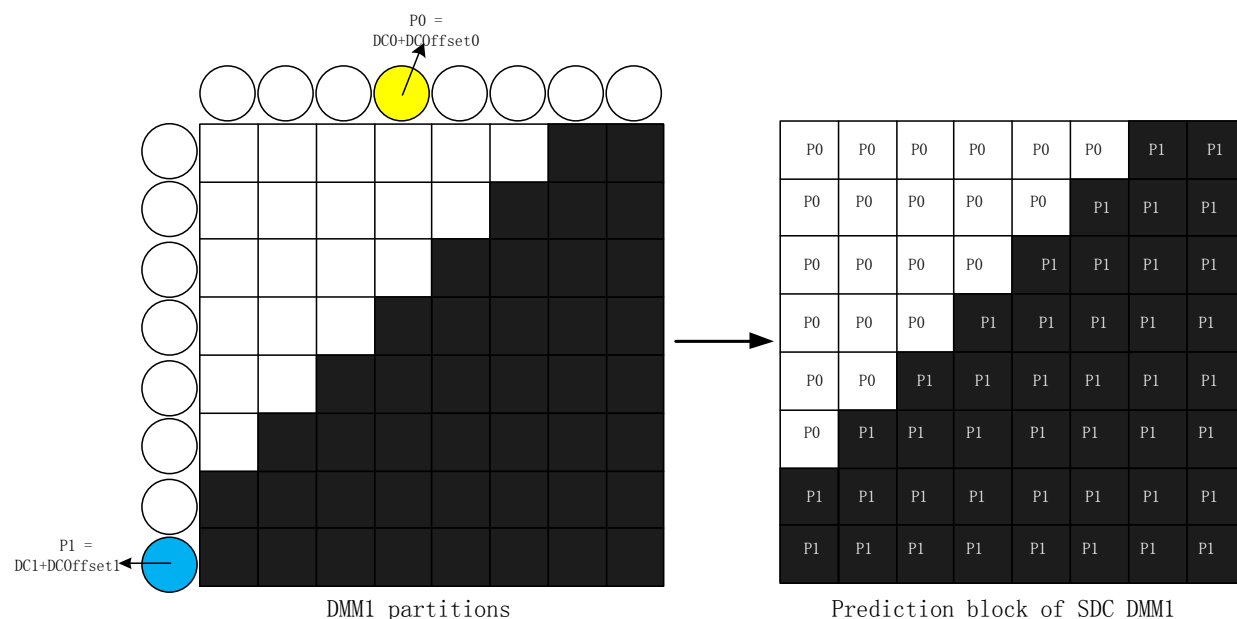
        if( bFirstSeg != ucSegment )
        {
            rpSegMeans[ucSegment] = ptmpOrig[x];
            bBreak = true;
            break;
        }
    }

    if( bBreak )
    {
        break;
    }

    ptmpOrig += uiStride;
    ptmpMask += uiMaskStride;
}
```

Current DC derivation design (3)

- The prediction block of SDC DMM1 and SDC DMM4 is composed of DC + DCOffset derived from DMM1 / DMM4



DC value for SDC DMM1 and SDC DMM4 are same as DC + DCOffset for DMM1 / DMM4!

Proposed method

- Reuse already predicted DC + DCOffset for DMM1 / DMM4 as DC for SDC DMM1 and SDC DMM4

Experimental results

● All intra (anchor: htm10.0r1)

	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%	0.0%	0.0%	0.00%	0.00%	0.00%	99.7%	100.8%	99.9%
Kendo	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.0%	94.3%	99.0%
Newspaper_CC	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	99.8%	104.9%	99.8%
GT_Fly	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.4%	100.2%	101.1%
Poznan_Hall2	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.5%	110.2%	98.5%
Poznan_Street	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.1%	102.6%	101.4%
Undo_Dancer	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	99.2%	101.6%	97.9%
Shark	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	99.9%	102.7%	101.7%
1024x768	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	99.8%	100.0%	99.5%
1920x1088	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.0%	103.5%	100.1%
average	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.0%	102.2%	99.9%

Experimental results (2)

● CTC (anchor: htm10.0r1)

	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%	0.0%	0.0%	0.00%	0.00%	0.00%	99.6%	98.0%	98.0%
Kendo	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.6%	105.3%	98.8%
Newspaper_CC	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.9%	98.3%	101.2%
GT_Fly	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.8%	94.5%	100.4%
Poznan_Hall2	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.1%	81.0%	95.9%
Poznan_Street	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.8%	94.8%	98.1%
Undo_Dancer	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	99.8%	81.6%	96.8%
Shark	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.9%	109.2%	99.9%
1024x768	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.4%	100.6%	99.3%
1920x1088	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.5%	92.2%	98.2%
average	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%	100.4%	95.3%	98.7%

Conclusions

- The proposed method unifies DC derivation process for DMM1, DMM4, SDC DMM1 and SDC DMM4 (Both software implementation and text are simplified)
- Suggest adopting the proposed method to WD and HTM



Thank you!

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