



CE6-related: Transform Skip Condition on Transform Block Size

Jeeyoon Park, Byeungwoo Jeon
Sungkyunkwan University (SKKU)

Transform Skip Condition on Transform Block size

- The current VVC draft 2.0.1
 - $\text{area.width} \leq 4 \ \&\& \ \text{area.height} \leq 4$
 → transform skip (TS) is possible

- the recent updated reference software code in VTM-2.0.1
 - $\text{area.width} * \text{area.height} \leq 16$
 → transform skip (TS) is possible

- Anchor (VTM-2.0.1)
 - Y: $4*4$
 - Cb,Cr: $2*2, 2*4, 2*8,$
 $4*4, 4*2, 8*2$

Test (2.0.1 VVC draft)
 Y: $4*4$
 Cb,Cr: $2*2, 2*4, \textcolor{red}{\cancel{2*8}}$
 $4*4, 4*2, \textcolor{red}{\cancel{8*2}}$

Experimental Results(1)

- Reference software: BMS-2.0.1, VTM configuration
 - Anchor: $\text{area.width} * \text{area.height} \leq 16$
(as in VTM-2.0.1)
 - Test: $\text{area.width} \leq 4 \ \&\& \ \text{area.height} \leq 4$
(as in VVC draft 2.0)

		All Intra Main10				
		Over VTM-2.0.1				
		Y	U	V	EncT	DecT
Class A1		0.00%	-0.07%	-0.02%	71%	76%
Class A2		0.00%	-0.02%	-0.07%	65%	70%
Class B		0.01%	0.04%	0.06%	62%	86%
Class C		0.00%	-0.03%	0.03%	98%	90%
Class E		0.00%	-0.02%	0.03%	100%	81%
Overall		0.00%	-0.01%	0.01%	76%	82%
Class D		-0.02%	0.19%	-0.28%	101%	89%
Class F (optional)		0.02%	-0.09%	0.00%	83%	76%

Experimental Results(2)

- Reference software: BMS-2.0.1, VTM configuration
 - Anchor: `area.width * area.height <=16`
(as in VTM-2.0.1)
 - Test: `area.width <=4 && area.height <=4`
(as in VVC draft 2.0)

Random Access Main 10					
Over VTM-2.0.1					
	Y	U	V	EncT	DecT
Class A1	#VALUE!	#VALUE!	#VALUE!	#DIV/0!	#DIV/0!
Class A2	#VALUE!	#VALUE!	#VALUE!	#DIV/0!	#DIV/0!
Class B	-0.03%	0.03%	-0.04%	67%	74%
Class C	-0.04%	-0.05%	0.02%	89%	94%
Class E					
Overall	#VALUE!	#VALUE!	#VALUE!	#DIV/0!	#DIV/0!
Class D	-0.02%	0.06%	0.44%	84%	92%
Class F (optional)	-2.15%	0.30%	-0.02%	66%	97%

Experimental Results(3)

- Reference software: BMS-2.0.1, VTM configuration
 - Anchor: `area.width * area.height <=16`
(as in VTM-2.0.1)
 - Test: `area.width <=4 && area.height <=4`
(as in VVC draft 2.0)

	Low delay B Main10				
	Over VTM-2.0.1			EncT	DecT
	Y	U	V		
Class A1 Class A2					
Class B	#VALUE!	#VALUE!	#VALUE!	#DIV/0!	#DIV/0!
Class C	-0.01%	0.03%	0.16%	83%	88%
Class E	-0.05%	0.21%	0.34%	85%	94%
Overall	#VALUE!	#VALUE!	#VALUE!	#DIV/0!	#DIV/0!
Class D	-0.04%	0.04%	0.07%	88%	88%
Class F (optional)	-0.01%	-1.39%	-1.08%	79%	95%

Conclusion

- This proposal provides performance comparison related to transform skip based on transform block size.
- With VTM-2.0.1 as the anchor, the tested condition shows that an average of 0.00%, -0.01% and 0.01% coding gain for AI, with run-time change of encoder time 76%, decoder time 82% respectively.
- It is recommended that the VTM-2.0.1 be modified to the tested condition.



THANK YOU