

JVET-Q0503: Encoder improvement for palette mode

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Summary

1. Modify error limit table used in K-means clustering

- QP dependent threshold table determining distance between two clusters
- Current table: `g_paletteQuant[52] = { 0, 0, 0, 0, 1, 1, 1, 2, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 5, 6, 6, 7, 7, 8, 9, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 21, 22, 24, 23, 25, 26, 28, 29, 31, 32, 34, 36, 37, 39, 41, 42, 45 }`
- **Modified table:** `g_paletteQuant[52] = { 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 3, 3, 3, 4, 4, 5, 5, 6, 6, 7, 8, 9, 10, 12, 13, 14, 16, 18, 20, 23, 26, 29, 33, 36, 41, 46, 51, 58, 65, 73, 82, 92, 102, 115, 131, 146 }`

2. Consider overhead of predictor reuse flags in RDO

Summary (cont.)

3. Increase RD cost precision in selecting palette index

- Current: $\text{RD cost} = \text{distortion} + \text{lambda} \times (\text{bypass coded bits} + (\text{context coded bits} \gg 15))$
- Proposed: $\text{RD cost} = (\text{distortion} \ll 15) + \text{lambda} \times ((\text{bypass coded bits} \ll 15) + \text{context coded bits})$

4. Remove unused entries in the palette table

Results (Dual Tree OFF)

- Anchor: palette mode in VTM7.0 (--DualTree=0)

	All Intra Main10				
	Over VTM-7.0 + dual tree off				
	Y	U	V	EncT	DecT
TGM 1080p	-0.80%	-0.93%	-1.07%	100%	99%
TGM 720p	-0.58%	-0.96%	-1.11%	100%	99%
Animation	-0.17%	-0.28%	-0.25%	100%	100%
Mixed content	-0.31%	-0.75%	-0.96%	101%	101%
Camera-Captured content	0.00%	0.00%	0.00%	100%	100%
Overall	-0.43%	-0.66%	-0.77%	100%	100%

	Random access Main10				
	Over VTM-7.0 + dual tree off				
	Y	U	V	EncT	DecT
TGM 1080p	-0.56%	-1.17%	-1.05%	100%	99%
TGM 720p	-0.93%	-1.83%	-1.75%	99%	99%
Animation	-0.29%	-0.33%	-0.33%	100%	100%
Mixed content	-0.29%	-1.06%	-1.22%	100%	100%
Camera-Captured content	0.00%	0.00%	0.00%	100%	99%
Overall	-0.48%	-1.01%	-0.99%	100%	100%

	Low delay B Main10				
	Over VTM-7.0 + dual tree off				
	Y	U	V	EncT	DecT
TGM 1080p	-0.16%	-0.32%	-0.27%	100%	98%
TGM 720p	-0.54%	-0.99%	-1.20%	100%	100%
Animation	-0.52%	-0.37%	-0.47%	100%	100%
Mixed content	-0.06%	-0.61%	-0.45%	101%	101%
Camera-Captured content	0.00%	0.00%	0.00%	100%	99%
Overall	-0.29%	-0.51%	-0.54%	100%	100%

Results (Dual Tree ON)

- Anchor: palette mode in VTM7.0 (--DualTree=1)

	All Intra Main10				
	Over VTM-7.0				
	Y	U	V	EncT	DecT
TGM 1080p	-0.88%	-1.23%	-1.30%	101%	100%
TGM 720p	-0.53%	-0.54%	-0.86%	101%	100%
Animation	-0.07%	-0.24%	-0.23%	100%	100%
Mixed content	-0.17%	-0.91%	-0.82%	103%	101%
Camera-Captured content	0.00%	-0.01%	0.00%	100%	100%
Overall	-0.40%	-0.66%	-0.74%	101%	100%

	Random access Main10				
	Over VTM-7.0				
	Y	U	V	EncT	DecT
TGM 1080p	-0.73%	-1.77%	-1.69%	99%	99%
TGM 720p	-0.37%	-1.80%	-2.61%	100%	99%
Animation	-0.29%	-0.35%	-0.39%	100%	100%
Mixed content	-0.16%	-2.69%	-2.64%	100%	101%
Camera-Captured content	-0.02%	0.02%	0.01%	100%	100%
Overall	-0.36%	-1.46%	-1.64%	100%	100%

	Low delay B Main10				
	Over VTM-7.0				
	Y	U	V	EncT	DecT
TGM 1080p	-0.27%	-0.58%	-0.52%	100%	98%
TGM 720p	-0.36%	-0.29%	-0.39%	100%	100%
Animation	-0.47%	-0.44%	-0.57%	101%	100%
Mixed content	-0.40%	-1.69%	-1.46%	102%	101%
Camera-Captured content	0.01%	-0.10%	-0.04%	100%	99%
Overall	-0.32%	-0.63%	-0.61%	100%	100%

We thank Kwai for the crosschecking !!



Thank you

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