Fixed-Length Coding for Escape Samples in Palette Mode

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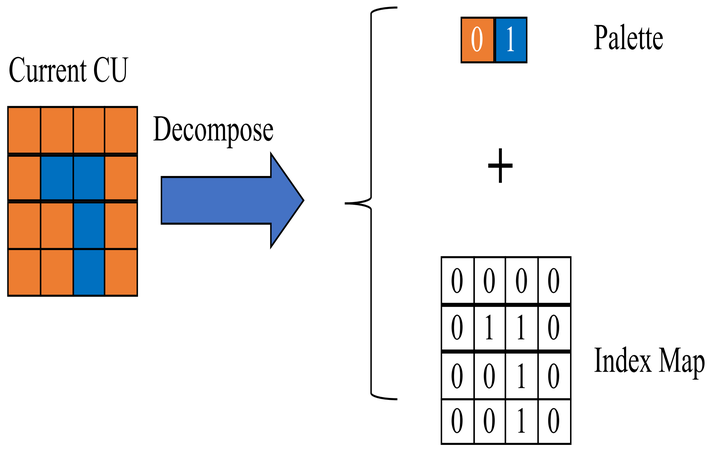
1. Introduction

- **Palette mode [2] is a powerful coding tool for screen content coding**



- **A sample can be coded as an escape sample in the PLT mode**
  - **If the minimal distortion between the current sample and the existing PLT entries is smaller than a pre-defined threshold. (VTM6)**

$$E = round\left((S * Qscale[QP\%6]) \gg \left(14 + \frac{QP}{6}\right)\right)$$

EG3 Binarization

$$S' = \left(round\left((E * invQscale[QP\%6]) \ll \left(\frac{QP}{6}\right)\right) \gg 6\right)$$

2. Proposed Scheme

- **Motivation:**
  - **Escape samples conform a uniform distribution.**
    - ***EG3 binarization may be not the suitable for escape sample coding.***
  - **The code length of an escape sample could depend on QP.**
    - ***Better tradeoff could be achieved if the binarization of escape samples is QP dependent.***
  - **The QPs for the escape samples are not same with the QPs for transform skip blocks.**
    - ***They shall be aligned since the escape samples are also coded without any transform.***

- **Proposed scheme:**

$$L = \max(1, \text{bitDepth} - (\max(\text{QpPrimeTsMin}, QP) - 4)/6)$$

$$E = round(S \gg L)$$

Fixed Length Binarization

$$Recon = E \ll L$$

3. Simulation Results

- Anchor : VTM6[1]
- Test : VTM6 with the proposed method
- QPs = {2, 7, 12, 17}

Sequence name	Y	U	V
FlyingGraphics	-2.6%	-3.8%	-3.9%
Desktop	-2.2%	-3.4%	-3.5%
ChineseEditing	-4.2%	-6.2%	-6.4%
Console	-4.3%	-5.0%	-4.9%
WebBrowsing	-0.6%	-1.1%	-1.2%
Map	-2.2%	-3.0%	-3.1%
Programming	-1.0%	-1.6%	-1.4%
SlideShow	-0.2%	-0.5%	-0.5%
TGM1080p	-3.3%	-4.6%	-4.7%
TGM 720p	-1.0%	-1.5%	-1.6%
Encoding Complexity	100%		
Decoding Complexity	100%		

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