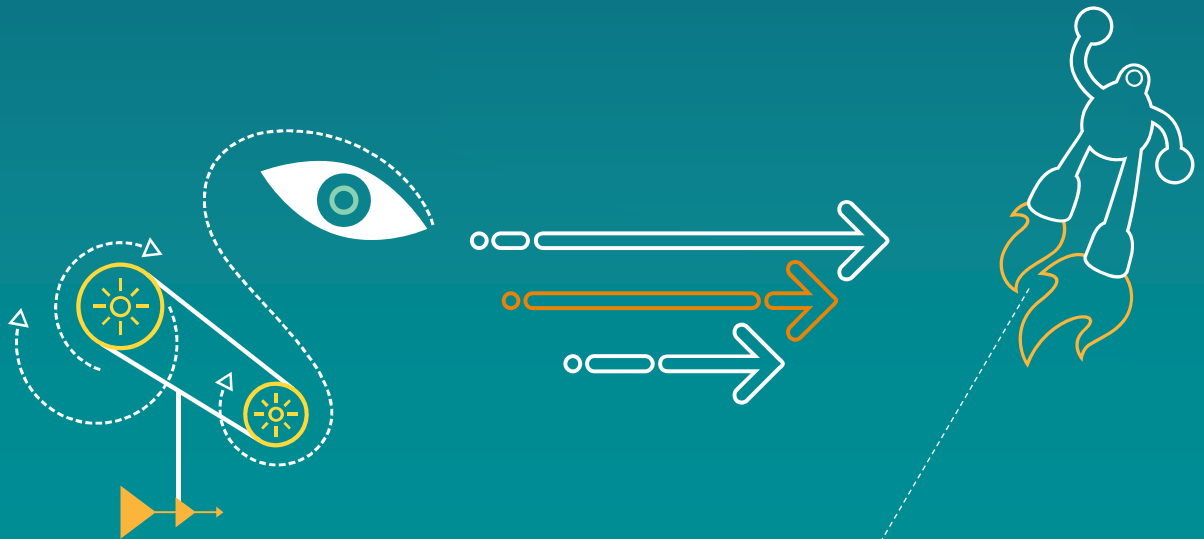R. Joshi, M. Karczewicz, W. Pu, V. Seregin, J. Sole

JCTVC-R0174
Non-SCCE3: Contexts for coding index runs

QUALCOMM®

Coding of runs for context

- Use of 2 additional contexts to code the runs for 'index' mode
  - Context depends on index value

Index	0	1, 2	> 2
context	0	1	2

- Implemented on top of SCCE3 palette AHG base and C4 with improved encoder

BD-rate results with respect to SCCE3 AHG

	All Intra			All Intra		
	G/Y	B/U	R/V	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p	-0.3%	-0.3%	-0.3%	-0.5%	-0.5%	-0.5%
RGB, text & graphics with motion,720p	-0.3%	-0.3%	-0.2%	-0.4%	-0.4%	-0.4%
RGB, mixed content, 1440p	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%
RGB, mixed content, 1080p	-0.1%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p	-0.3%	-0.4%	-0.3%	-0.5%	-0.6%	-0.6%
YUV, text & graphics with motion,720p	-0.2%	-0.4%	-0.3%	-0.3%	-0.4%	-0.4%
YUV, mixed content, 1440p	-0.1%	-0.1%	-0.1%	-0.1%	-0.2%	-0.2%
YUV, mixed content, 1080p	-0.1%	-0.2%	-0.2%	-0.1%	-0.3%	-0.3%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	100%			101%		
Dec Time[%]	100%			102%		

Full-frame IBC   Two CTU IBC

BD-rate results with respect to C4 with improved encoder

	All Intra			All Intra		
	G/Y	B/U	R/V	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p	-0.6%	-0.6%	-0.6%	-0.9%	-0.9%	-0.8%
RGB, text & graphics with motion,720p	-0.4%	-0.4%	-0.4%	-0.6%	-0.6%	-0.6%
RGB, mixed content, 1440p	-0.1%	-0.1%	-0.1%	-0.2%	-0.2%	-0.2%
RGB, mixed content, 1080p	-0.2%	-0.2%	-0.1%	-0.3%	-0.2%	-0.3%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p	-0.6%	-0.6%	-0.7%	-0.8%	-0.9%	-1.0%
YUV, text & graphics with motion,720p	-0.4%	-0.4%	-0.5%	-0.6%	-0.6%	-0.7%
YUV, mixed content, 1440p	-0.2%	-0.2%	-0.2%	-0.2%	-0.3%	-0.3%
YUV, mixed content, 1080p	-0.2%	-0.2%	-0.2%	-0.3%	-0.4%	-0.4%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	100%			101%		
Dec Time[%]	101%			103%		

Full-frame IBC   Two CTU IBC

4

Coding of runs for context

- Good complexity vs performance tradeoff

- Much higher gains when implemented on top of a combination of palette tools (C4 with improved encoder)

  - Good synergy with other palette tools being considered.

- When choosing palette tools synergies between different tools should be considered

Additional results

- Use exponential Golomb with parameter 2 to encode remaining run values instead of the current method.

- Replace

    - xWriteCoefRemainExGolomb((uiRun - 3), uiGoRiceParamRun, ..)

- With

    - xWriteEpExGolomb((uiRun - 3), 2);

Coding remaining runs using EG2 with respect to C4 with improved encoder

	All Intra			All Intra		
	G/Y	B/U	R/V	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p	-0.4%	-0.3%	-0.3%	-0.5%	-0.5%	-0.5%
RGB, text & graphics with motion,720p	-0.3%	-0.3%	-0.2%	-0.3%	-0.3%	-0.3%
RGB, mixed content, 1440p	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
RGB, mixed content, 1080p	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
RGB, Animation, 720p	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p	-0.4%	-0.4%	-0.4%	-0.6%	-0.6%	-0.6%
YUV, text & graphics with motion,720p	-0.3%	-0.4%	-0.3%	-0.4%	-0.4%	-0.4%
YUV, mixed content, 1440p	-0.1%	-0.1%	-0.2%	-0.1%	-0.2%	-0.2%
YUV, mixed content, 1080p	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%
YUV, Animation, 720p	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Enc Time[%]		105%			106%	
Dec Time[%]		107%			110%	

Full-frame IBC   Two CTU IBC