

Non-CE1: Escape coded pixel prediction for palette based coding[JCTVC-T0052]

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20th JCT-VC meeting, Geneva, 2015/2/10-18

- In current test model of SCC, no prediction for escape coded pixels
- The methods of escape coded pixel prediction were proposed in Strasbourg, JCTVC-S0052, JCTVC-S0053, JCTVC-S0054
- This contribution improved the methods and tested them on top of SCM3.0

- Method1: Escape coded pixel prediction by palette predictor.
 - The predictor is constructed from palette predictor by excluding the reused elements for palette prediction.
- Method2: Escape coded pixel prediction by escape predictor.
 - The predictor is constructed from the escape coded pixels of previous coded CUs. The construction method is similar to that of palette predictor's.
- Method3: Escape coded pixel prediction by either palette predictor or escape predictor.
 - Combination of method1 and method2.

Simulation results(lossless,Method1)

■ Anchor: SCM3.0

■ MAX_PLT_PRED_SIZE=64

	All Intra			
	Bit-rate change (Total)	Bit-rate change (Average)	Bit-rate change (Min)	Bit-rate change (Max)
RGB, text & graphics with motion, 1080p & 720p	-0.1%	-0.1%	-0.4%	0.0%
RGB, mixed content, 1440p & 1080p	0.0%	0.0%	-0.1%	0.0%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	-0.2%	-0.2%	-0.5%	0.0%
YUV, mixed content, 1440p & 1080p	0.0%	0.0%	0.0%	0.0%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	108%			
Dec Time[%]	103%			

Simulation results(lossy,Method1)

■ Anchor: SCM3.0

■ MAX_PLT_PRED_SIZE=64

	All Intra		
	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p & 720p	0.0%	0.0%	0.0%
RGB, mixed content, 1440p & 1080p	0.0%	0.0%	0.0%
RGB, Animation, 720p	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	0.0%	0.0%	0.0%
YUV, mixed content, 1440p & 1080p	0.0%	0.0%	0.0%
YUV, Animation, 720p	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%
Enc Time[%]	104%		
Dec Time[%]	103%		

Simulation results(lossless,method2)

■ Anchor: SCM3.0

■ MAX_ESC_PRED_SIZE = 64

	All Intra			
	Bit-rate change (Total)	Bit-rate change (Average)	Bit-rate change (Min)	Bit-rate change (Max)
RGB, text & graphics with motion, 1080p & 720p	-1.0%	-1.0%	-1.8%	-0.1%
RGB, mixed content, 1440p & 1080p	-0.2%	-0.2%	-0.2%	-0.2%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	-1.4%	-1.5%	-4.5%	-0.1%
YUV, mixed content, 1440p & 1080p	-0.1%	-0.1%	-0.2%	-0.1%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	130%			
Dec Time[%]	103%			

Simulation results(lossy, method2)

■ Anchor: SCM3.0

■ MAX_ESC_PRED_SIZE = 64

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

Simulation results(lossless,method2)

■ Anchor: SCM3.0

■ MAX_ESC_PRED_SIZE = 128

	All Intra			
	Bit-rate change (Total)	Bit-rate change (Average)	Bit-rate change (Min)	Bit-rate change (Max)
RGB, text & graphics with motion, 1080p & 720p	-1.5%	-1.5%	-3.1%	-0.1%
RGB, mixed content, 1440p & 1080p	-0.3%	-0.3%	-0.3%	-0.2%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	-2.0%	-2.1%	-7.0%	-0.2%
YUV, mixed content, 1440p & 1080p	-0.2%	-0.2%	-0.3%	-0.1%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	145%			
Dec Time[%]	103%			

Simulation results(lossy, method2)

■ Anchor: SCM3.0

■ MAX_ESC_PRED_SIZE = 128

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

Simulation results(lossless,method3)

- Anchor: SCM3.0
- MAX_ESC_SIZE=64
- MAX_ESC_PRED_SIZE=64

	All Intra			
	Bit-rate change (Total)	Bit-rate change (Average)	Bit-rate change (Min)	Bit-rate change (Max)
RGB, text & graphics with motion, 1080p & 720p	-1.5%	-1.5%	-3.1%	-0.2%
RGB, mixed content, 1440p & 1080p	-0.3%	-0.3%	-0.3%	-0.2%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	-2.0%	-2.1%	-7.0%	-0.2%
YUV, mixed content, 1440p & 1080p	-0.2%	-0.2%	-0.3%	-0.1%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	120%			
Dec Time[%]	110%			

Simulation results(lossy,method3)

- Anchor: SCM3.0
- MAX_ESC_SIZE=64
- MAX_ESC_PRED_SIZE=64

	All Intra		
	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p & 720p	-0.1%	-0.1%	-0.1%
RGB, mixed content, 1440p & 1080p	0.0%	0.0%	0.0%
RGB, Animation, 720p	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	0.0%	0.0%	0.0%
YUV, mixed content, 1440p & 1080p	0.0%	0.0%	0.0%
YUV, Animation, 720p	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%
Enc Time[%]	107%		
Dec Time[%]	113%		

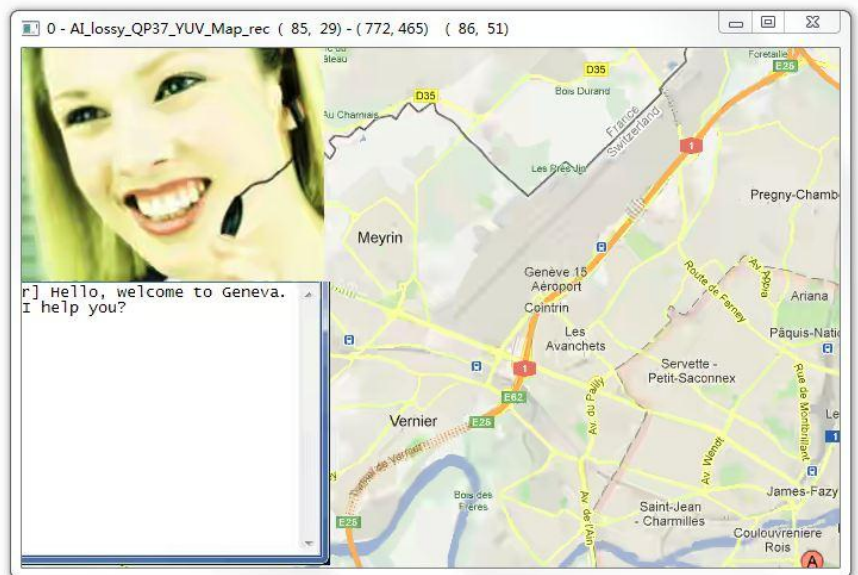
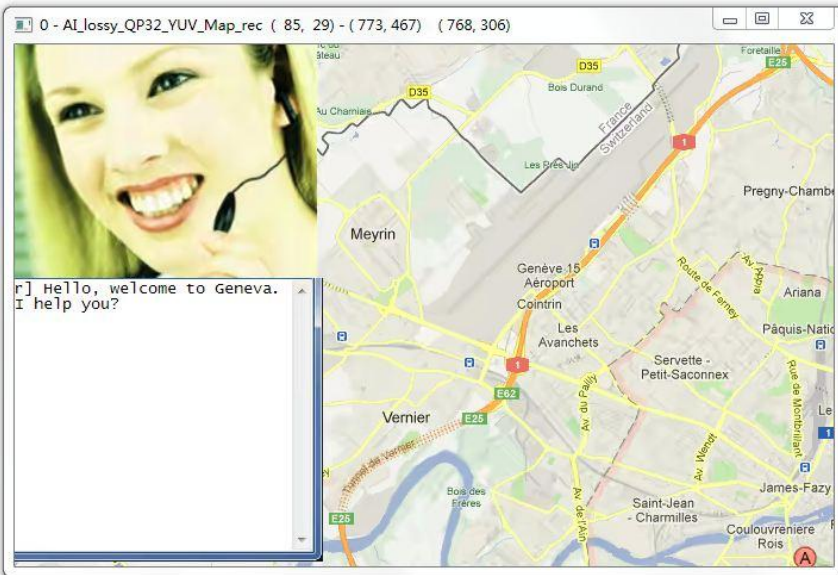
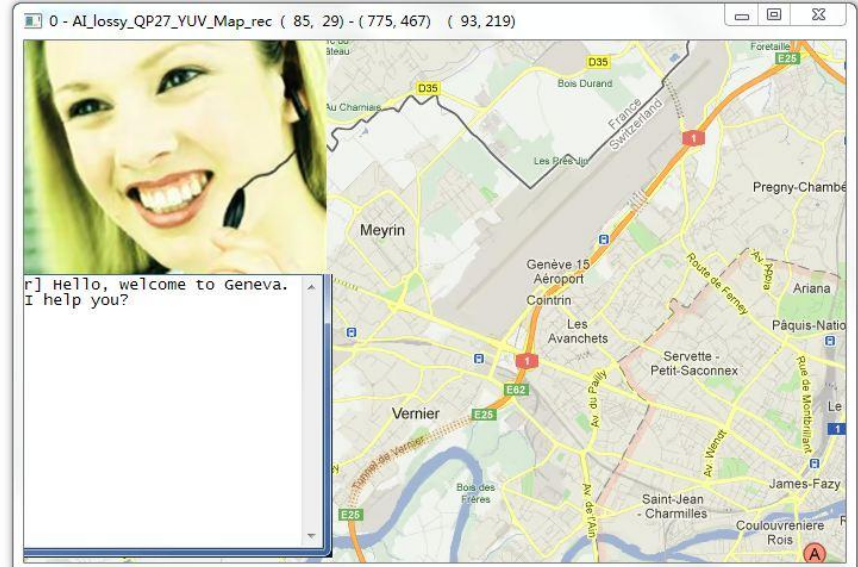
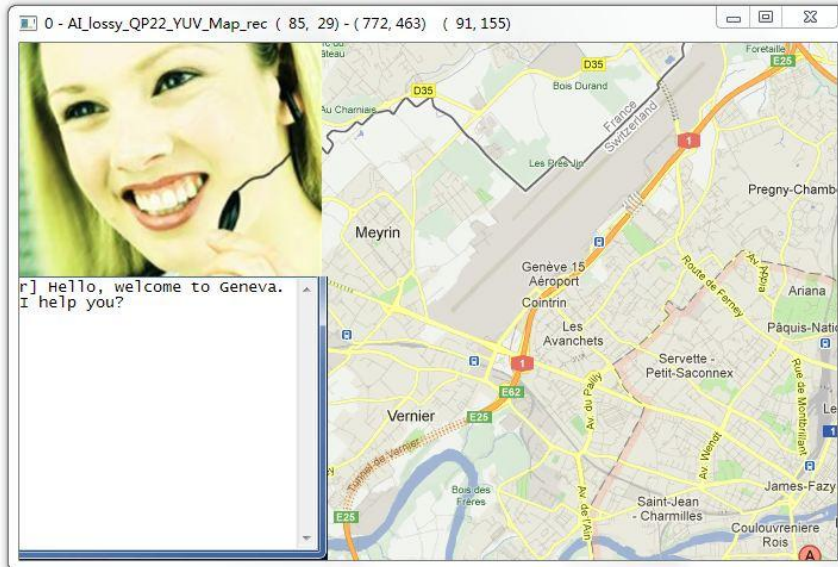
Test compare on methods

- Anchor: SCM3.0
- MAX_ESC_PRED_SIZE=64, MAX_PLT_PRED_SIZE=64

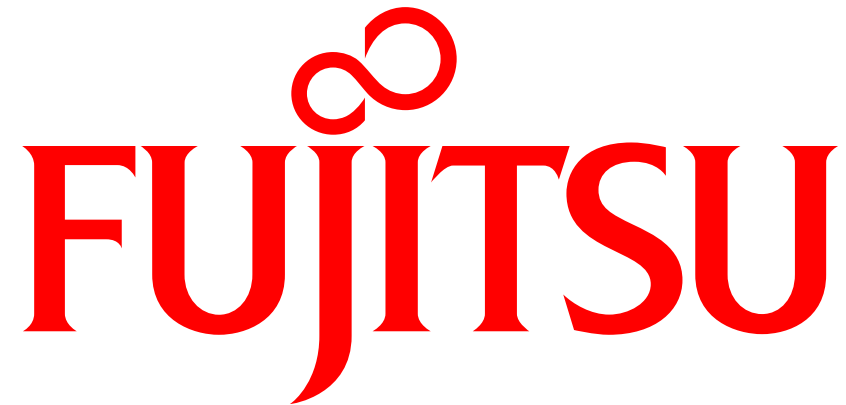
	AI,lossless		
	method1	method2	method3
RGB, text & graphics with motion, 1080p & 720p	-0.1%	-1.0%	-1.5%
RGB, mixed content, 1440p & 1080p	0.0%	-0.2%	-0.3%
RGB, Animation, 720p	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	-0.2%	-1.4%	-2.0%
YUV, mixed content, 1440p & 1080p	0.0%	-0.1%	-0.2%
YUV, Animation, 720p	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%
Enc Time[%]	108%	130%	120%
Dec Time[%]	103%	103%	110%

- Visually lossy coding is not good for SCC. CTC of lossy coding of SCC is not appropriate. Smaller QP should be tested.

Lossy coding for SCC



- Escape coded pixel prediction shows gain on lossless coding.
- Thanks cross-checking of Media Tek.
- Suggest to future CE.



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