

# Non-SCCE3: Modified copy above mode for palette based coding[JCTVC-R0078]

Jianqing Zhu, Zhanglei Xu, Jiangli Ye  
Fujitsu R&D Center Co., Ltd

18<sup>th</sup> JCT-VC meeting, Sapporo, 2014/6/30-7/09

## ■ Palette base coding tools in SCCE3

- For run derivation of “copy-above mode”, index of current position and that of its above position is compared to judge whether use copy or not.
- For the pixel in escape mode, copy mode will not be applicable.

Original coding unit

C0	C0	C1	C2	C2	C1	C0	C3
C0	C0	C1	C2	C2	C1	C0	C3
C0	C0	C1	C2	C2	C1	C0	C0
C0	C0	C1	C2	C2	C1	C0	C0
C0	C0	C1	C2	C2	C1	C0	C0
C6	C6	C0	C0	C1	C1	C7	C7
C6	C6	C6	C0	C0	C0	C7	C7
C4	C4	C4	C4	C4	C0	C0	C5

Palette={C0,C1,C2,C4,C6,C7},

Index deriving

Copy run=7

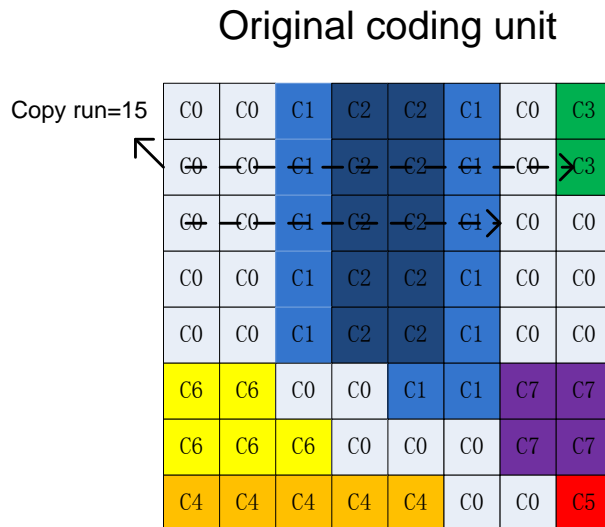
0	0	1	2	2	1	0	C3
0	0	1	2	2	1	0	C3
0	0	1	2	2	1	0	0
0	0	1	2	2	1	0	0
0	0	1	2	2	1	0	0
4	4	0	0	1	1	5	5
4	4	4	0	0	0	5	5
3	3	3	3	3	0	0	C5

3 This pixel is in palette. And its index is 3

C3 This pixel is in escape mode. And its value is C3

- Q0174 proposed to compare/match pixel value directly rather than index value for “copy-above mode”.

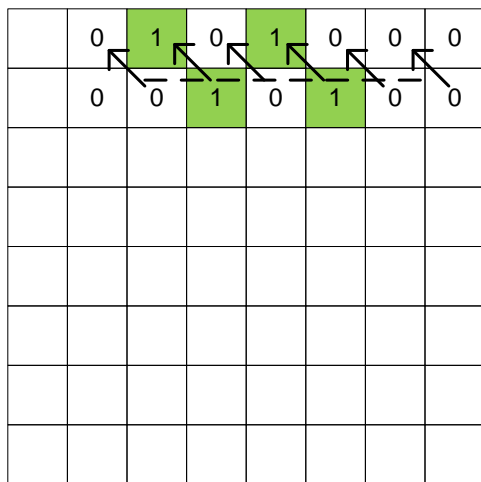
- Evaluates Q0174 on top of SCCE3 anchor.
- Use pixel value directly for run derivation of “copy-above mode”.
  - No index derivation. Just compare pixel value of current position and its above to judge whether it can be copy or not.
  - copy mode will not care about the pixel value is in escape or not.



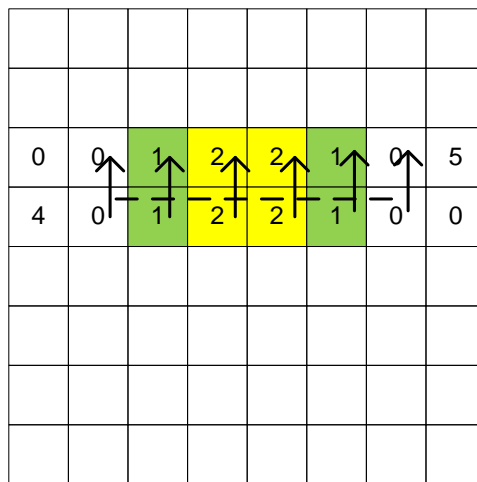
Palette={C0,C1,C2,C4,C6,C7},

## ■ 2. Extends “copy-above” mode to multiple directions.

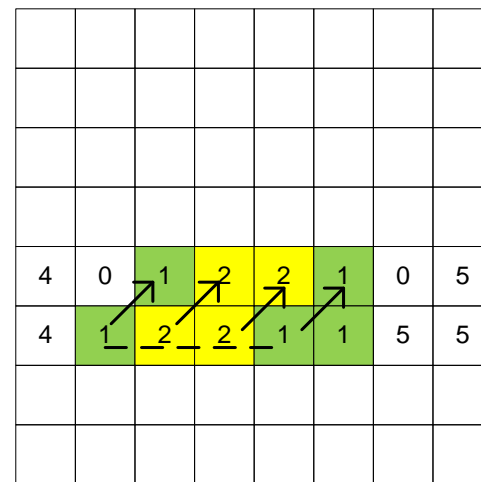
- A syntax element of CU level, **copy\_above\_dir**, will be used to indicate the direction.
- **copy\_above\_dir** presents only if copy above mode is used.



1)copy above left  
 $\text{pixel}(x,y) == \text{pixel}(x-1,y-1)$



2)copy above  
 $\text{pixel}(x,y) == \text{pixel}(x,y-1)$



3) copy above right  
 $\text{Pixel}(x,y) == \text{pixel}(x+1,y-1)$

# Simulation results(lossless, 1 direction)

## ■ Anchor: SCCE3 (2CTU IBC) anchor

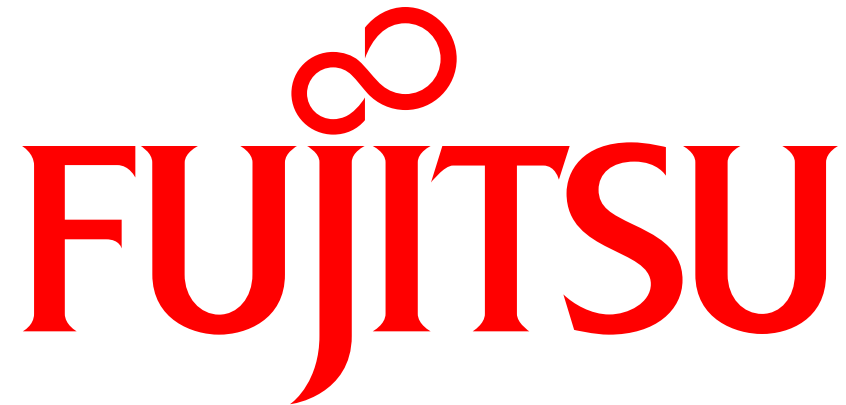
	All Intra			
	Bit-rate saving (Total)	Bit-rate saving (Average)	Bit-rate saving (Min)	Bit-rate saving (Max)
RGB, text & graphics with motion, 1080p	0.1%	0.1%	0.0%	0.2%
RGB, text & graphics with motion,720p	0.1%	0.1%	0.0%	0.1%
RGB, mixed content, 1440p	0.0%	0.0%	0.0%	0.0%
RGB, mixed content, 1080p	0.0%	0.0%	0.0%	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	0.1%	0.1%	0.0%	0.1%
YUV, text & graphics with motion,720p	0.0%	0.0%	0.0%	0.1%
YUV, mixed content, 1440p	0.0%	0.0%	0.0%	0.0%
YUV, mixed content, 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[%]	95%			
Dec Time[%]	62%			

# Simulation results(lossless, 3 directions)

## ■ Anchor: SCCE3 (2CTU IBC) anchor

	All Intra			
	Bit-rate saving (Total)	Bit-rate saving (Average)	Bit-rate saving (Min)	Bit-rate saving (Max)
RGB, text & graphics with motion, 1080p	0.2%	0.2%	0.0%	0.4%
RGB, text & graphics with motion,720p	0.5%	0.4%	0.0%	1.4%
RGB, mixed content, 1440p	0.0%	0.0%	0.0%	0.0%
RGB, mixed content, 1080p	0.0%	0.0%	0.0%	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	0.1%	0.1%	0.0%	0.2%
YUV, text & graphics with motion,720p	0.6%	0.4%	0.0%	1.5%
YUV, mixed content, 1440p	0.0%	0.0%	0.0%	0.0%
YUV, mixed content, 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[%]	110%			
Dec Time[%]	117%			

- Simpler and small gain on copy above mode.
- Multiple copy above directions is worthy to study.
- Suggest to list this proposal to future CE.



shaping tomorrow with you