



Non-RCE4: A combination of the four-neighbor major color index prediction in JCTVC-P0098 and a simplified transition copy mode from JCTVC-P0115 on top of RCE4 Test1

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Overall Summary

- A combination of the four-neighbor major color index prediction in JCTVC-P0098 and the transition copy mode in JCTVC-P0115
 - On top of RCE4 Test1 (JCTVC-P0108)

- Results

Lossy coding BD-rate	AI-MT	RA-MT	LB-MT
SC YUV 444 sequences	-4.1%	-3.7%	-2.8%

- For further study in a CE

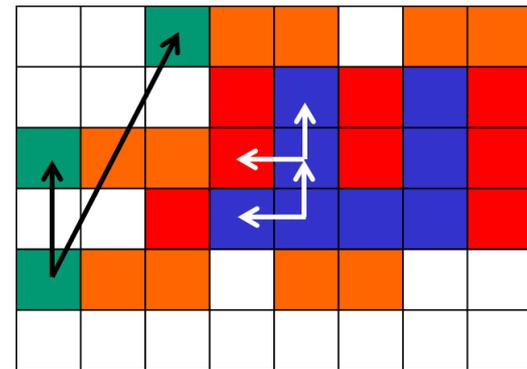
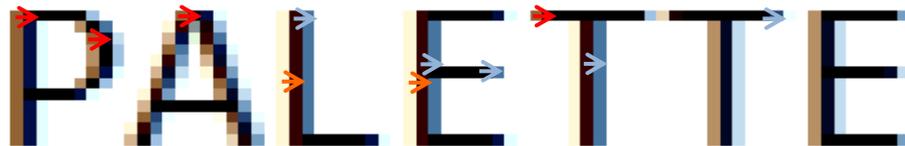
Four-neighbor Prediction in JCTVC-P0098

- Method 1
 - Add the major color indices of the above-left (AL) sample and the above-right (AR) sample into the prediction candidate list: {A, L, no prediction, AL, AR}
 - Any redundant candidate is pruned
 - To maximize coding efficiency, use an adaptive candidate list size and adaptive codewords of the selected candidate index

	Codeword	
	Original	If (L == A)
Copy above	1	1
Copy left	00	10
No prediction	010	010
Copy above-left	0111	0111
Copy above-right	0110	0110

Transition Copy Mode in JCTVC-P0115

- Add a new transition copy (TC) mode that takes into account a previous position of the same index
 - Search the causal area to find a matching position with the left sample of the current sample
 - The matching position is signaled and the sample to the right of the matching position is used for predicting the current sample



Proposed Method

- Combine JCTVC-P0098 and JCTVC-P0115
 - Form an initial candidate list: {A, L, TC, AL, AR, NoPred}
 - Perform pruning
 - Signal a candidate index
- Although method-1 (adaptive candidate list size) in JCTVC-P0098 is used here as an example, method-2 (fixed candidate list size) can also be easily combined.
- Simplification of the Transition Copy (TC) candidate
 - For each coded index of a sample, its coded index of the next sample is recorded in a table and treated as a TC candidate.
 - When coding the current sample, the index of the left sample is used as the table input to find the TC candidate quickly.
 - No search in the causal area is needed.

Lossy Coding Results

- Anchor: RCE4 Test1
- 4.1% / 3.7% / 2.8% BD-rate savings for SC YUV 444 sequences under AI-MT / RA-MT / LB-MT
- Thank Canon for cross-verification

BD-rate Y	AI-MT	AI-HT	AI-SHT	RA-MT	RA-HT	LB-MT	LB-HT
Class F	-0.6%	-0.6%	-0.5%	-0.2%	-0.2%	-0.2%	-0.1%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC RGB 444	-4.9%	-4.9%	-4.7%	-4.3%	-4.2%	-3.7%	-3.7%
Animation RGB 444	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%
SC YUV 444	-4.1%	-5.0%	-5.5%	-3.7%	-4.0%	-2.8%	-3.4%
Animation YUV 444	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%
RangeExt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC(444) GBR Opt.	-12.3%	-12.4%	-12.0%	-10.8%	-11.7%	-10.7%	-11.2%
SC(444) YUV Opt.	-10.4%	-11.8%	-12.4%	-8.9%	-10.6%	-9.2%	-10.3%

Lossless Coding Results

- Anchor: RCE4 Test1
- 4.5% / 3.6% / 3.3% bit savings for YCbCr 444 SC sequences under AI / RA / LB

	AI	RA	LB
Class F	-0.2%	0.0%	0.0%
Class B	0.0%	0.0%	0.0%
RGB 4:4:4 SC	-4.1%	-3.3%	-3.1%
RGB 4:4:4 Animation	-0.2%	-0.2%	-0.2%
YCbCr 4:4:4 SC	-4.5%	-3.6%	-3.3%
YCbCr 4:4:4 Animation	-0.5%	-0.5%	-0.5%
RangeExt	0.0%	0.0%	0.0%
RGB 4:4:4 SC (Optional)	-10.3%	-9.8%	-11.2%
YCbCr 4:4:4 SC (Optional)	-10.5%	-9.7%	-8.1%

Conclusions

- A combination of JCTVC-P0098 and JCTVC-P0115 is proposed.
- Results on top of RCE4 Test1

Lossy coding BD-rate	AI-MT	RA-MT	LB-MT
SC YUV 444 sequences	-4.1%	-3.7%	-2.8%

- For further study in a CE