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JVET-AE0178

Non-EE2: Cross-component Prediction Merge Mode for Chroma Inter Coding

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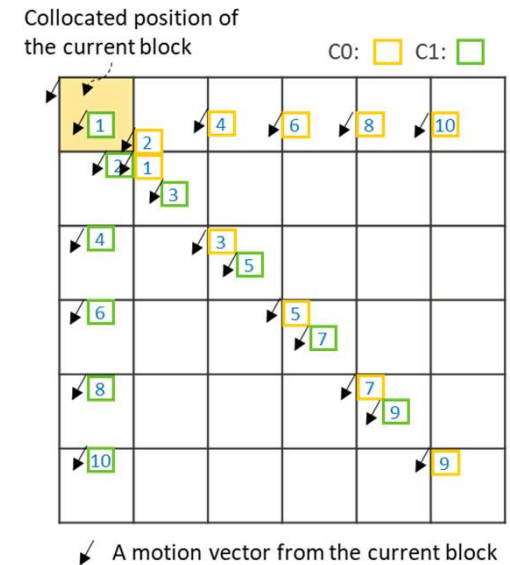
Overall Summary

- Cross-component prediction (CCP) merge mode was adopted in ECM-9.0
 - Model inherited from spatial adjacent, spatial non-adjacent, history-based and default candidates
 - JVET-AD0048 proposes to inherit CCP models from temporal and shifted temporal candidates
- Propose to extend CCP merge mode to inter coding blocks
 1. A CCP merge list is constructed for chroma inter coding
 2. Chroma inter prediction is derived using an inherited CCP model, which is then combined with motion-compensation prediction

Over ECM-9.0	RA				
	Y	Cb	Cr	EncT	DecT
Class A1	-0.48%	-1.97%	-2.64%	107.1%	103.1%
Class A2	-0.63%	-2.32%	-3.38%	105.1%	102.2%
Class B	0.04%	-1.22%	-1.07%	104.7%	100.6%
Class C	0.04%	-0.73%	-0.74%	105.7%	99.7%

Proposed Method

- Construct one CCP merge list for chroma inter coding
 - Include all the CCP merge candidates used in chroma intra coding
 - Also include the 2nd type shifted temporal candidates, derived based on the current motion vector
- Select the CCP model with the smallest template cost
- Combine cross-component and motion-compensation prediction
 - The cross-component predictors are obtained based on the selected CCP model
 - $(w_CCP, w_Inter) = (3/4, 1/4)$
- One flag indicates whether the proposed method is used for an inter block



Experimental Results

- The proposed method was implemented on top of ECM-9.0
- Maximum allowed candidates is set to 12

	Proposal over ECM 9.0									
	RA					LB				
	Y	Cb	Cr	EncT	DecT	Y	Cb	Cr	EncT	DecT
Class A1	-0.48%	-1.97%	-2.64%	107.1%	103.1%					
Class A2	-0.63%	-2.32%	-3.38%	105.1%	102.2%					
Class B	0.04%	-1.22%	-1.07%	104.7%	100.6%	0.11%	-2.46%	-2.62%	104.8%	101.7%
Class C	0.04%	-0.73%	-0.74%	105.7%	99.7%	0.00%	-1.21%	-1.76%	106.7%	101.3%
Class E						0.08%	0.08%	-0.01%	105.2%	103.9%
Overall										
Class D	0.13%	-0.88%	-0.72%	104.5%	99.8%	-0.04%	-1.38%	-1.70%	105.9%	100.4%
Class F	-0.11%	-0.80%	-0.92%	104.4%	101.1%	-0.30%	-1.71%	-1.44%	103.3%	104.2%

The results presented in class A2 for RA and class B/F for LB are short-length simulation results

Conclusions

- Proposed to extend CCP merge mode to chroma inter coding
- Considering the promising coding gains of the proposed method, the method is recommended to be further studied in EE2

