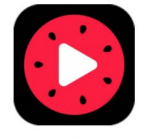


JVET-AE0121

Non-EE2: Luma Residual Taps in Chroma-ALF and CCALF

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Summary

■ Motivation

- Luma Residuals Have been Stored and Used in Luma-ALF of ECM-9.0
- Luma Residual Usage Can be Further Extended to Chroma-ALF and CCALF
- Improve Chroma Performance

■ Proposed Solution

- Luma Residual based Extension for Chroma-ALF
- Luma Residual based Extension for CCALF

Chroma-ALF and CCALF in ECM-9.0

■ Chroma-ALF

- 9x9 Diamond Filter Shape
- Only Contain Spatial Taps
- Shown as Figure-1

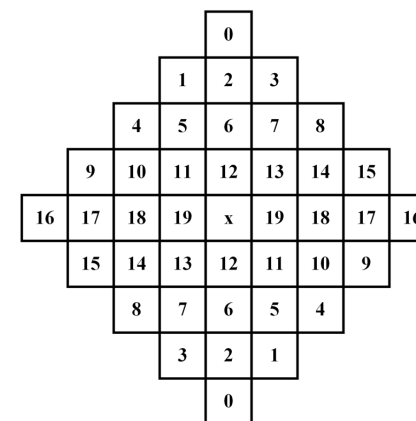


Figure-1

Diamond 9x9 Chroma Filter Shape

■ CCALF

- 9x9 Cross-Liked Filter Shape
- Only Contain Spatial Taps
- Shown as Figure-2

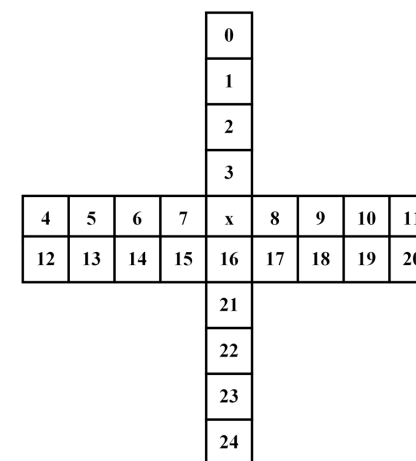


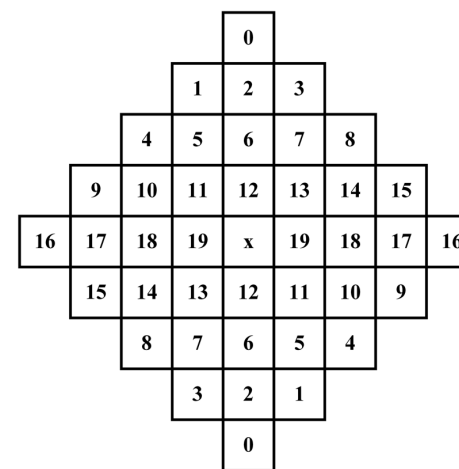
Figure-2

Cross 9x9 CCALF Filter Shape

Proposed Methods

■ Chroma-ALF

- Keep Spatial Taps Unchanged
- Add 1 Residual based Tap
- Shown as Figure-3



Diamond 9x9 Chroma Filter Shape

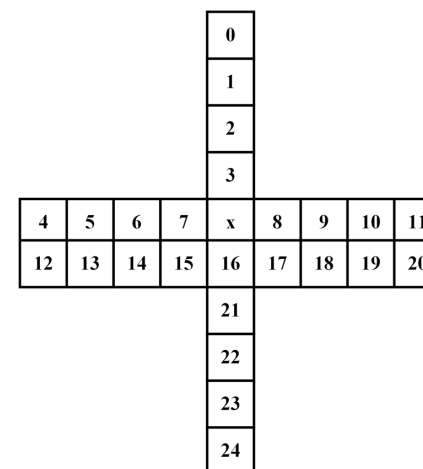


Figure-3

Luma Residual based Tap

■ CCALF

- Keep Spatial Taps Unchanged
- Add 1 Residual based Tap
- Shown as Figure-4



Cross 9x9 CCALF Filter Shape

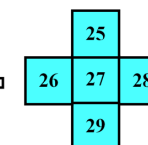


Figure-4

Luma Residual based Tap

Simulation Results

- Anchor is ECM-9.0
- Table Shows the Performance of the Proposed Method

	RA					LB				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class-A1*	0.04%	-0.55%	-1.12%	99.6%	100.8%					
Class-A2*	0.02%	-0.76%	-1.23%	99.7%	99.4%					
Class-B	0.02%	-0.76%	-0.66%	100.2%	99.5%					
Class-C	0.00%	-0.15%	0.08%	99.7%	100.6%	0.04%	-1.53%	-1.20%	99.7%	100.1%
Class-E						-0.03%	-2.74%	-2.97%	100.2%	99.7%
Overall*	0.02%	-0.56%	-0.67%	99.8%	100.0%					
Class-D	-0.01%	0.08%	0.33%	100.5%	101.9%	0.01%	-1.28%	-1.05%	99.8%	102.4%
Class-F	-0.04%	-0.05%	-0.04%	99.9%	100.2%					

Conclusion

- Extensions of Luma Residual Taps in Chroma-ALF and CCALF are Proposed
- Simple and Straightforward Extension of the Luma Residual Usage
- Promising Chroma Coding Gain Can be Achieved with Limited Coding Time Increase
- Recommended to Include into Next Round of EE2
- Thanks Oppo for Cross-Checking

Thanks!