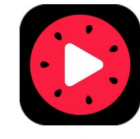


JVET-AD0236

Non-EE2: On Classification of In-Loop Filters

Wenbin Yin, Kai Zhang, Li Zhang,
Bytedance Inc.



Summary

■ Motivation

- Boundary and Non-Boundary Positions Have Different Noise Levels
- Rich Texture and Smooth Contents Have Different Noise Levels
- Efficient Classification Can Improve the Reconstruction Quality of Loop Filters

■ Proposed Solution

- DBF-BS based Classification for ALF
- DBF-BS based Classification for SAO
- Variance based Classification for BF

Classification of Loop Filters in ECM-8.0

■ Classification for ALF

- 2 Switchable Classifiers
- Band based Classifier
- Texture based Classifier

■ Classification for SAO

- 2 Switchable Classifiers
- Band based Classifier
- Edge based Classifier
- Signal 4 Offsets for a Selected Classifier

■ Classification for BF

- Filtering Strength Related to QP, Size and Prediction Mode of a TU

Proposed Methods

■ Classification for ALF

- Keep 2 Switchable Classifiers
- Classify Each Unit into 2 Levels based on DBF-BS (Boundary and Non-Boundary)
- Reduce Number of Classes in Existing Classifiers
- Combine Existing Classifier Results and DBF-BS Results for Each Unit

■ Classification for SAO

- Keep 2 Switchable Classifiers
- Classify Each Position into 2 Levels based on DBF-BS (Boundary and Non-Boundary)
- Keep the Existing Classifiers Unchanged
- Signaling : Signal 8 Offsets for a Selected Classifier

■ Classification for BF

- Classify Each TU into 5 Levels based on Variance (Rich Texture and Smooth Content)
- Keep the Existing Classification Unchanged
- Introduce More Filter Strengths into BF
- Adaptive Filter Strength Selection based on TU Texture Level

Simulation Results

- Anchor is ECM-8.0
- Table shows the joint performance of the proposed methods

	AI					RA					LB				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class-A1	0.02%	-0.03%	0.20%	101%	101%	-0.07%	0.17%	0.00%	101%	100%					
Class-A2	-0.03%	0.17%	0.17%	101%	100%	-0.09%*	0.13%	0.26%	100%	100%					
Class-B	0.00%	-0.08%	-0.04%	99%	99%	-0.03%	-0.03%	-0.04%	99%	101%					
Class-C	-0.03%	-0.11%	-0.01%	100%	100%	-0.24%	0.01%	0.14%	100%	100%	-0.25%	0.05%	0.44%	100%	100%
Class-E	-0.04%	-0.03%	-0.04%	101%	99%						-0.27%	1.97%	-0.57%	100%	102%
Overall	-0.01%	-0.03%	0.04%	100%	100%	-0.10%*	0.05%	0.08%	100%	101%					
Class-D	-0.03%	-0.11%	-0.03%	99%	101%	-0.08%	0.11%	-0.19%	100%	99%	-0.07%	-0.52%	0.74%	100%	100%
Class-F	0.04%	-0.20%	-0.21%	103%	97%	-0.16%	-0.44%	-0.17%	100%	102%					

Conclusion

- Additional Rules for Classification of In-Loop Filters are Proposed
- 3 Aspects are Included:
 - DBF-BS based Classification for ALF
 - DBF-BS based Classification for SAO
 - Variance based Classification for BF
- Promising Coding Gain Can be Achieved with Limited Coding Time Increase
- Recommended to Include into Next Round of EE2
- Thanks Ericsson for Cross-Checking

Thanks!