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CE8 Subtest 3: Adaptation between ALF and AO

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Summary

- MediaTek, Qualcomm, and Toshiba's joint proposal on adaptation between ALF and AO
  - Unified pixel classification for ALF and AO
  - Adaptation between ALF and AO at slice level

- Better coding efficiency with less decoding time

Anchor: JCTVC-D600	HE-AI	HE-RA	HE-LD
BD-Rate	-0.2%	-0.7%	-1.0%
Encoding Time	100%	100%	100%
Decoding Time	89%	89%	90%

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Outline

- Algorithm description

- Simulation results

- Conclusions

Adaptation between ALF and AO

- Unified pixel classification for ALF and AO
  - Only one pixel classification method in the design
  - Classify all pixels into 15 groups
  - One filter/offset for a group

- ALF
  - Different groups can be merged
  - Enable CU on/off control

- AO
  - A special case of filtering with only offset
  - Less computation complexity
  - Group merging and CU on/off control are disable

- Adapt between ALF and AO at slice level

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Unified Pixel Classification

- Apply edge classification first
  - Classify all pixels into 9 groups
  - Compare the current pixel, C, with eight neighboring pixels, p0-p7

p0	p1	p2
p3	C	p4
p5	p6	p7
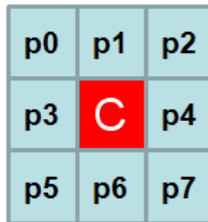
$$CTable[17] = \{ 1, 1, 2, 2, 3, 3, 4, 0, 0, 0, 5, 5,$$
$$6, 6, 7, 7, 8 \};$$

$$groupIdx = 8;$$
$$for(i = 0; i < 8; i++)$$
$$\{$$
$$\quad groupIdx += (\ (imgY[C]>imgY[pi]) -$$
$$\quad\quad\quad (imgY[C]<imgY[pi]) \ ) ;$$
$$\}$$
$$Category[C] = CTable[groupIdx];$$

- Category 0 is further divided
  - 7 groups, based on the sum of Laplacian method (Activity)
  - Activity = abs (2C – p3 – p4) + abs (2C – p1 – p6)

- Total 15 groups

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Simulation Results

- JCTVC-D600 anchor

- Not only better coding efficiency but also less decoding time

	HE-AI	HE-RA	HE-LD
BD-Rate (%)	-0.2	-0.7	-1.0
Enc. Time (%)	100	100	100
Dec. Time (%)	89	89	90

		HE-AI	HE-RA	HE-LD
Class A	Traffic	-0.3	-1.6	
	PeopleOnStreet	-0.9	-1.9	
	Nebuta	0.0	0.0	
	SteamLocomotive	0.1	0.5	
Class B	Kimono	0.1	0.0	-0.4
	ParkScene	-1.1	-1.4	-1.8
	Cactus	-0.3	-0.8	-0.7
	BasketballDrive	-0.1	0.0	0.0
	BQTerrace	-0.3	-1.8	-0.6
Class C	BasketballDrill	-0.8	-1.2	-1.9
	BQMall	-0.2	-1.0	-1.7
	PartyScene	-0.4	-0.8	-1.1
	RaceHorses	-0.1	-0.3	-0.6
Class D	BasketballPass	0.2	0.1	-0.2
	BQSquare	-0.5	-1.1	-1.1
	BlowingBubble	-0.2	-0.7	-1.1
	RaceHorses	0.0	-0.3	-1.4
Class E	Vidyo1	0.0		-0.6
	Vidyo3	-0.4		-3.3
	Vidyo4	0.0		-0.2

Conclusions

- ## Adaptation between ALF and AO
  - Slice-level adaptation
  - Unified pixel classification
  - Add AO to reduce the average decoding time

- ## Better coding efficiency and less decoding time

Anchor: JCTVC-D600	HE-AI	HE-RA	HE-LD
BD-Rate	-0.2%	-0.7%	-1.0%
Encoding Time	100%	100%	100%
Decoding Time	89%	89%	90%

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Thank you