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CE8.c.5: Non-cross-slices SAO

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Overall Summary

- Modified non-cross-slices SAO
    - Replace skipping by padding or changing pixel classification patterns for edge offset (EO) processing at slice boundaries

- Results:
    - Better subjective quality but need to be confirmed by the subjective viewing sessions
    - No objective coding efficiency change
    - No noticeable run time change

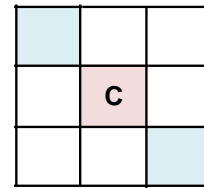**MEDIATEK**

Non-Cross-Slices SAO

- Edge offset (EO)
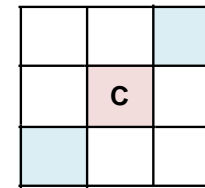 - Use two neighboring pixels to perform pixel classification
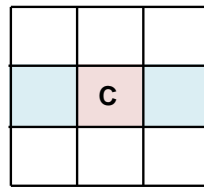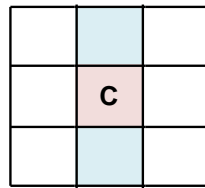
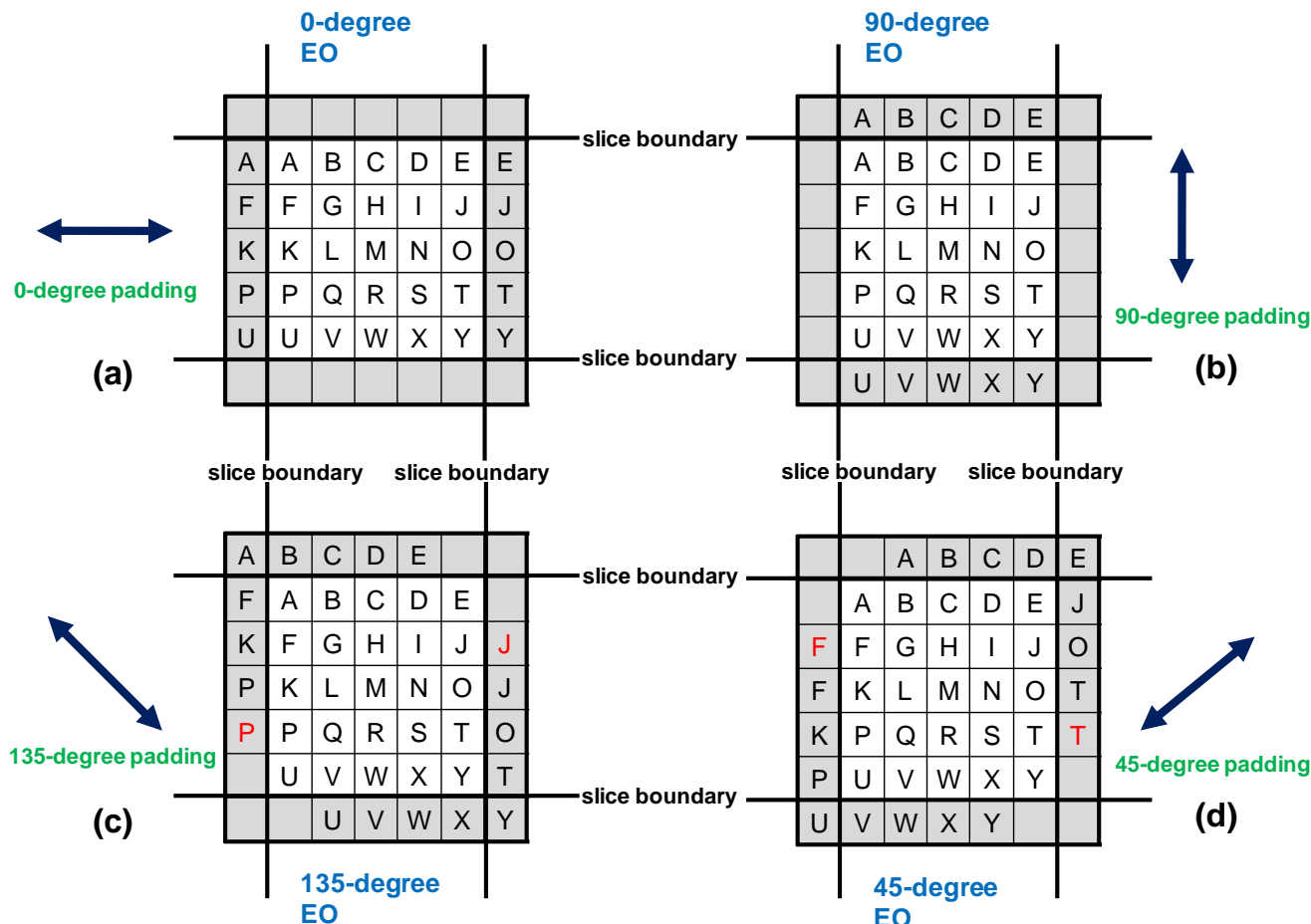| 0-Degree EO | 90-Degree EO | 135-Degree EO | 45-Degree EO |

- When the pixel classification of EO requires any pixel not belonging to the current slice, the pixel is skipped.
  - Could cause slice boundary artifacts

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Proposed Slice Boundary Processing

- Use directional padding according to the EO pattern

Simulation Result

- 10 LCUs per slice

- Anchor
  - Non-cross-slices SAO in HM-4.0

- Test:
  - Proposed non-cross-slices SAO

	All Intra HE			All Intra LC		
	Y	U	V	Y	U	V
Class A	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class C	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Class D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class E	0.0%	0.3%	0.2%	0.0%	0.3%	0.2%
Overall	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%
	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%
Enc Time[%]		100%			100%	
Dec Time[%]		101%			101%	

	Random Access HE			Random Access LC		
	Y	U	V	Y	U	V
Class A	0.0%	0.0%	-0.1%	0.0%	-0.1%	0.0%
Class B	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Class C	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class D	0.0%	0.1%	0.2%	0.0%	-0.2%	0.0%
Class E						
Overall	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Enc Time[%]		100%			100%	
Dec Time[%]		99%			101%	

	Low Delay B HE			Low Delay B LC		
	Y	U	V	Y	U	V
Class A						
Class B	0.0%	0.1%	-0.1%	0.0%	0.0%	-0.1%
Class C	0.0%	0.1%	0.0%	0.0%	-0.2%	-0.2%
Class D	0.0%	0.0%	-0.1%	0.0%	-0.1%	0.0%
Class E	0.0%	0.1%	0.0%	0.1%	0.0%	-0.2%
Overall	0.0%	0.1%	0.0%	0.0%	-0.1%	-0.1%
	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%
Enc Time[%]		100%			100%	
Dec Time[%]		101%			100%	

	Low Delay P HE			Low Delay P LC		
	Y	U	V	Y	U	V
Class A						
Class B	0.0%	-0.2%	-0.3%	0.0%	-0.2%	0.0%
Class C	0.0%	-0.2%	-0.1%	0.0%	-0.2%	0.1%
Class D	0.0%	-0.2%	-0.3%	0.0%	-0.1%	0.3%
Class E	0.0%	0.1%	0.5%	0.1%	-0.1%	0.0%
Overall	0.0%	-0.2%	-0.1%	0.0%	-0.2%	0.1%
	0.0%	-0.2%	-0.1%	0.0%	-0.2%	0.1%
Enc Time[%]		100%			100%	
Dec Time[%]		100%			101%	

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Conclusions

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