

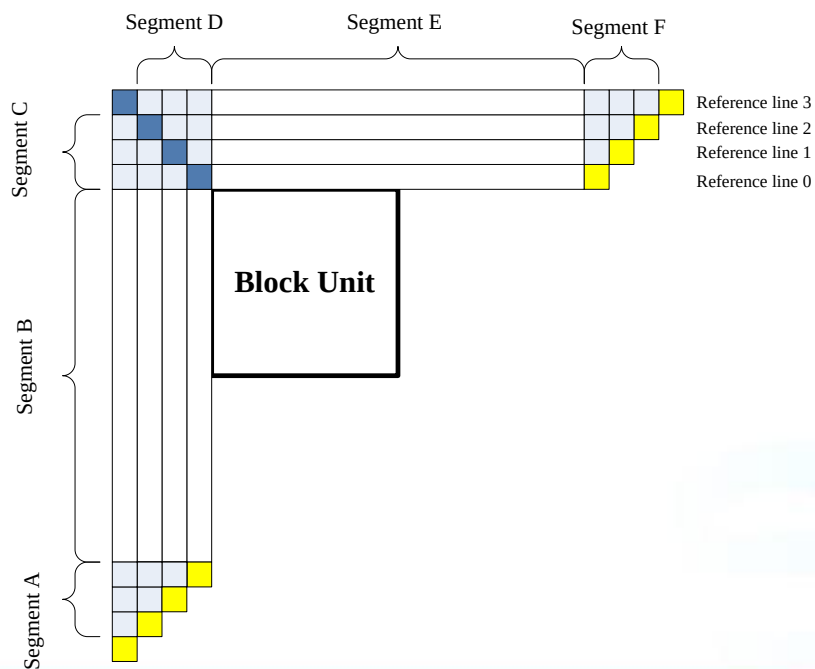
Further Investigations on Multi-Line Intra Prediction (JVET-J0065)

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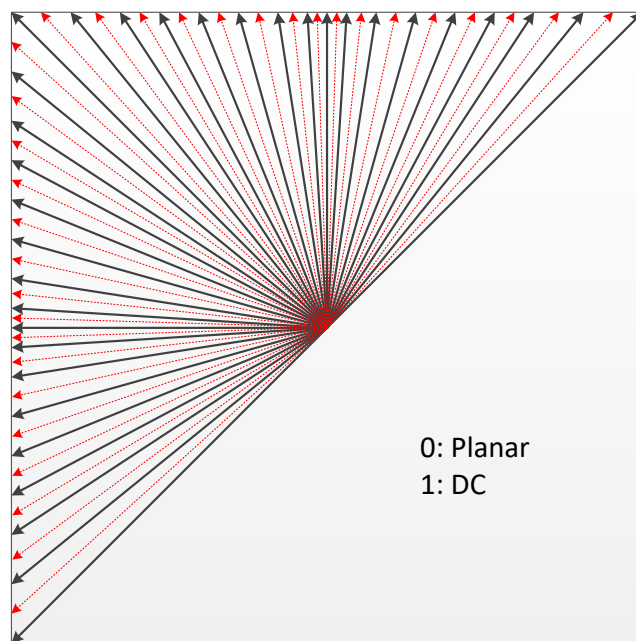
Introduction

- Multi-line intra prediction in JVET-J0029
 - Four reference lines are supported
 - Reference line index is signaled before intra prediction mode
 - Pixels in Segment A and F are padded with the closest pixels in Segment B and E respectively.
 - Planar and DC modes are disabled for non-zero reference lines



Proposal

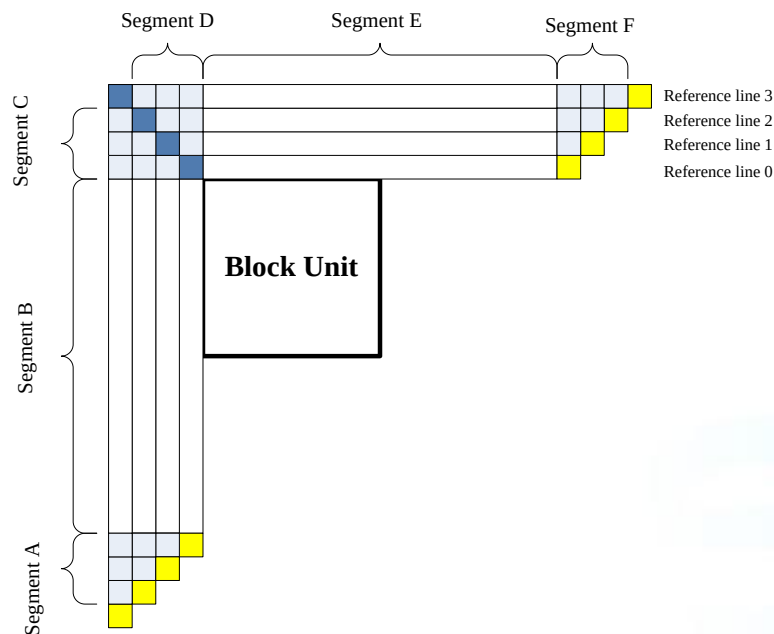
- Mode dependent reference line selection
 - For directional intra prediction modes with an even mode index, each of the four reference lines can be used and the selection is signaled
 - For the remaining modes, only reference line with index 0 can be used and reference line index is not signaled



- Directional intra modes with odd mode index
- Directional intra modes with even mode index

Proposal

- Reference sample extension
 - Instead of padding the closest samples from Segment B and E, the reconstructed values of reference samples in Segment A and F are used when they are available.
 - The reference sample buffer is extended by two samples to avoid clipping in 4-tap interpolation filter



Results

- Anchor: Tencent's CfP software (JVET-J0029)
- Test condition: CTC in JVET-G1010

	All Intra Main10				
	Y	U	V	EncT	DecT
Class A1	-0.12%	0.05%	-0.03%	96%	97%
Class A2	-0.13%	-0.03%	-0.07%	98%	98%
Class B	-0.17%	-0.12%	-0.10%	98%	98%
Class C	-0.28%	-0.24%	-0.28%	96%	99%
Class D	-0.27%	-0.14%	-0.31%	95%	97%
Class E	-0.23%	-0.16%	-0.23%	95%	97%
Overall	-0.19%	-0.10%	-0.16%	96%	98%

Conclusion

- This contribution provides -0.19% AI gain with small encoding time reduction compared to Tencent's CfP software in CTC condition.
- It is recommended to further study the proposed method

Thanks!