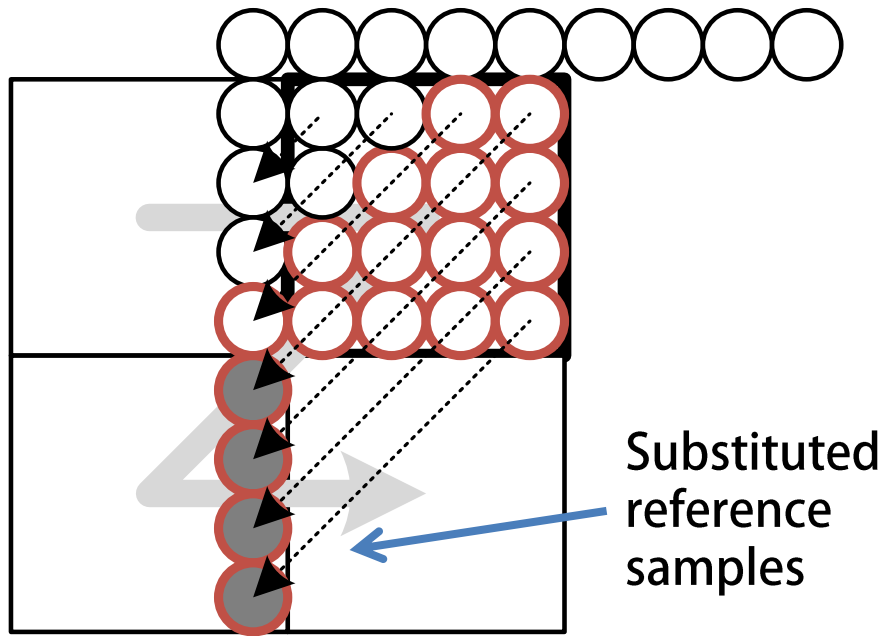


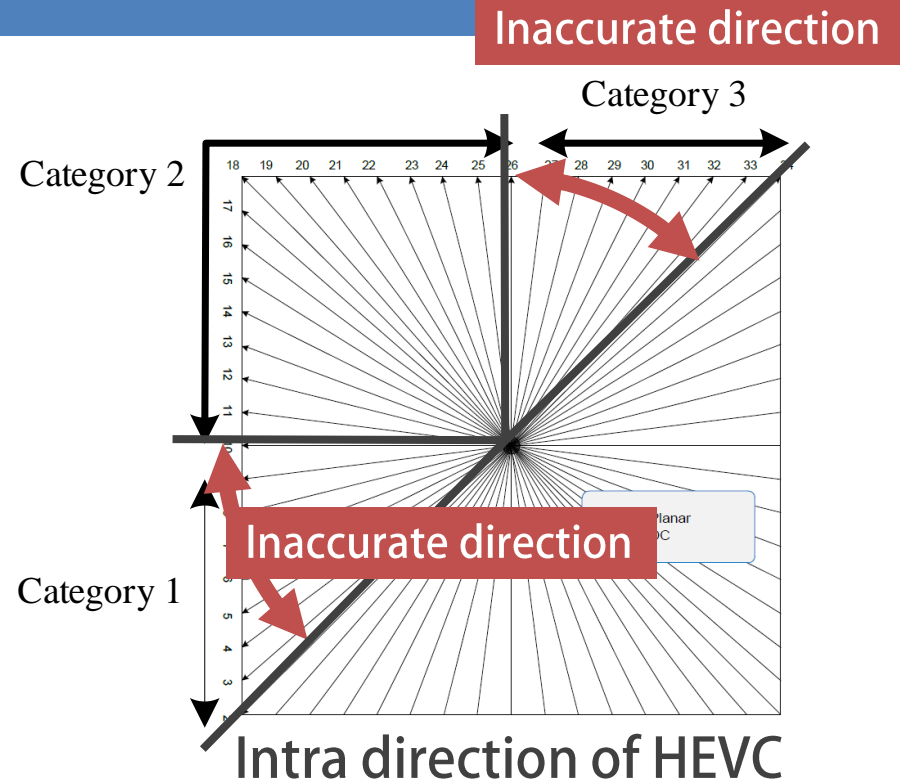
JVET-B0028: Direction-dependent sub-TU scan order on intra prediction

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Motivation



Sub-divided TUs of intra CU



Inaccurate intra prediction caused by reference sample substitution is observed for mode 2-9 and 27-34 of HEVC, 2-17 and 51-66 of JEM

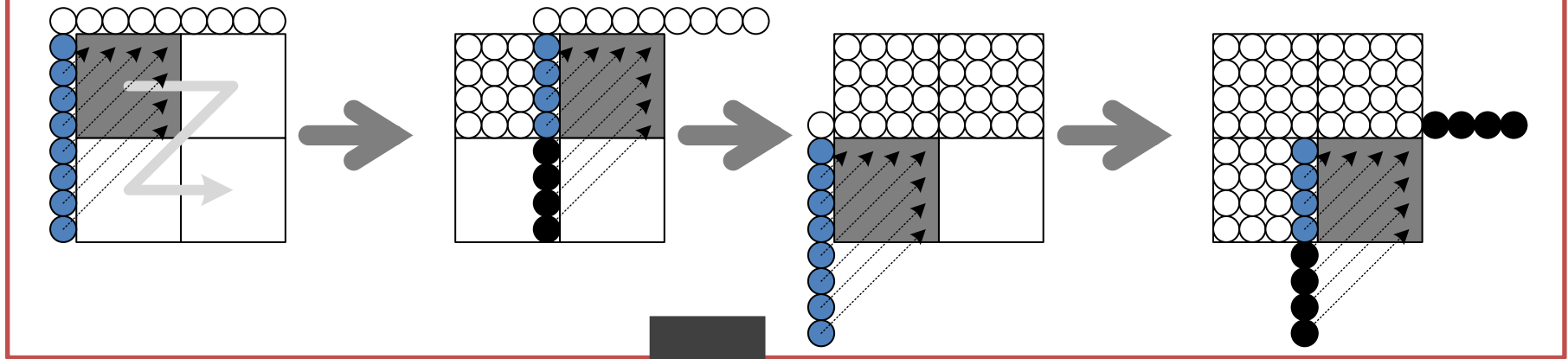
Direction-dependent sub-TU scan order is proposed.

Modification of sub-TU scan order

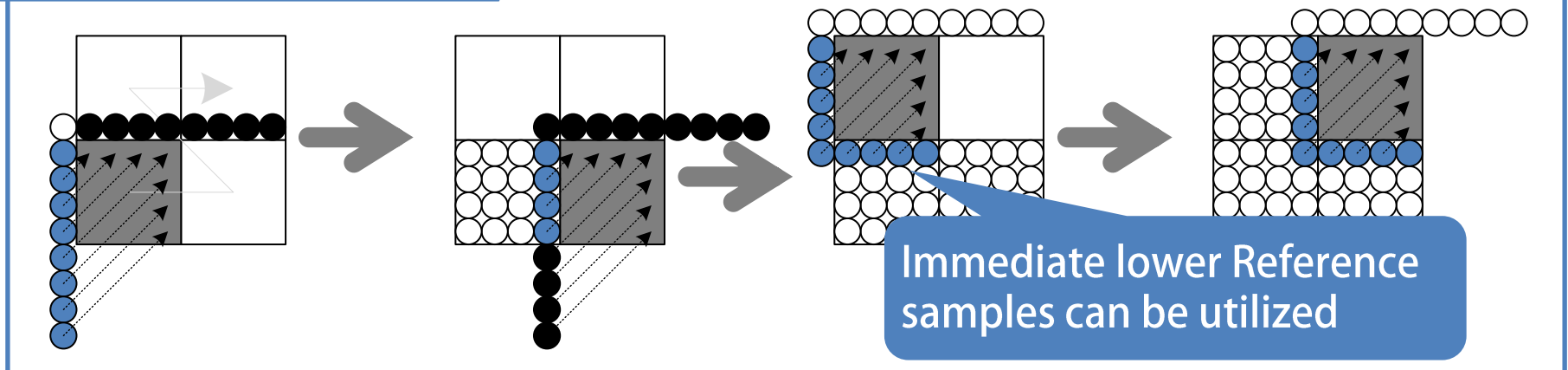
For intra prediction mode 2-9 of HEVC

● Referred “available” sample
● “Not available” sample

Z-scan order of HEVC



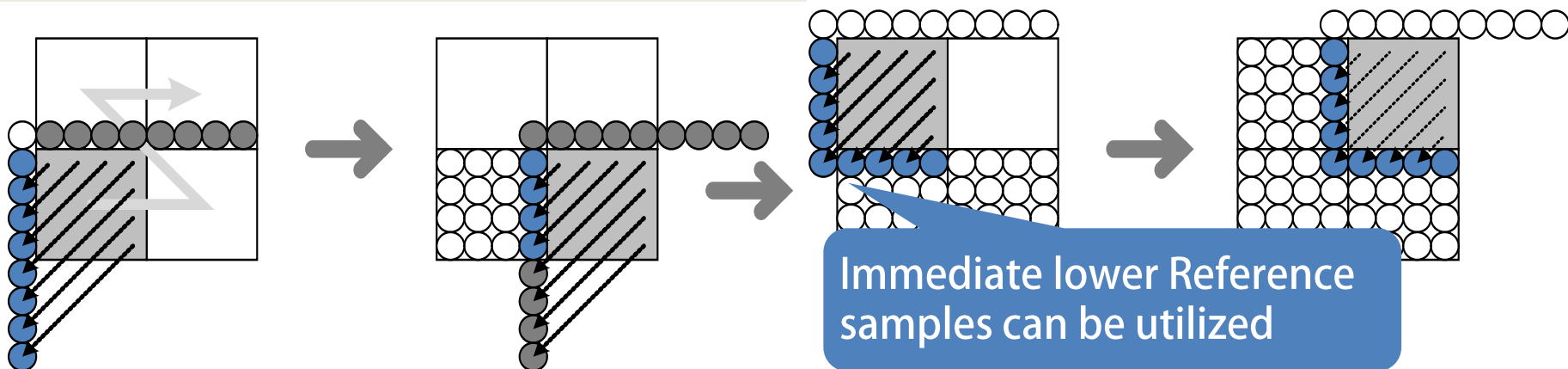
Proposed z-scan order



Depending on intra prediction direction, sub-TU scan order is reversed

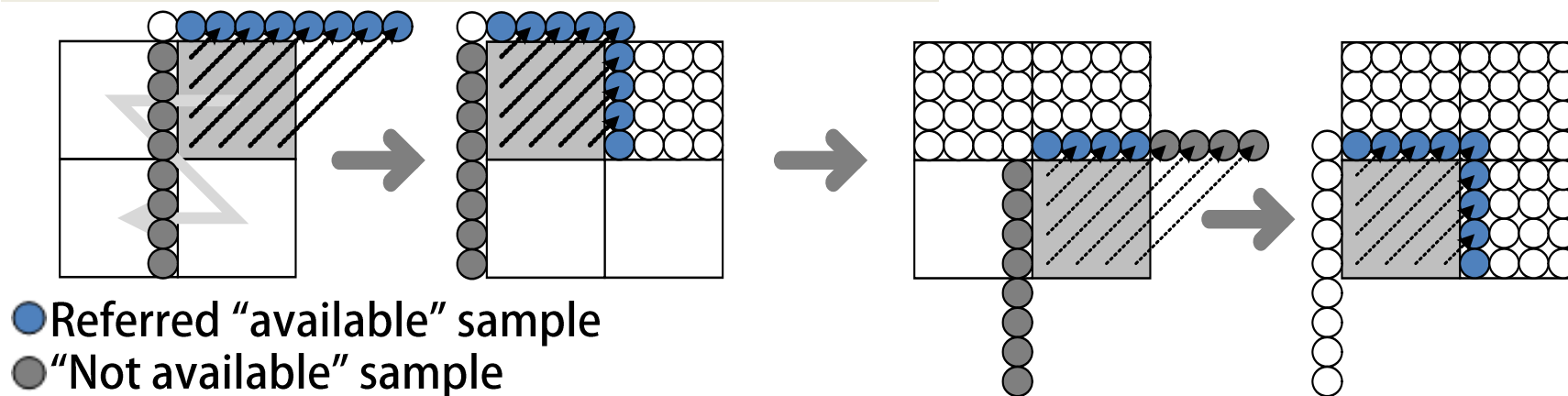
Proposed sub-TU scan order

For intra prediction mode 2-9 of HEVC



For intra prediction mode 27-34 of HEVC

Horizontally reverse



- Improving accuracy by using lower/right reference samples
- Semantics change, No additional syntax and encoder trial

Experimental Result

Integrated on top of HM16.7

Vs. HM16.7

	All Intra Main10		
	Y	U	V
Class A	-0.2%	-0.5%	-0.4%
Class B	-0.2%	-0.4%	-0.5%
Class C	-0.1%	-0.3%	-0.2%
Class D	-0.1%	-0.2%	-0.1%
Class E	-0.3%	-0.5%	-0.5%
Overall	-0.2%	-0.4%	-0.3%
Class F	-0.1%	-0.2%	-0.3%
Enc Time		101%	
Dec Time		100%	

- ✓ BD rate gain for all class of test sequences.
- ✓ Very slight increase of encoding time.

Conclusion

Direction-dependent sub-TU scan order is proposed.

- Inaccurate intra prediction caused by reference substitution is reduced.
- Right/lower-side reference samples can be newly utilized to improve accuracy of prediction.
- BD rate gain is observed with slight increase of enc. Time.

Recommendation

- Potentially synergistic for all intra tools of JEM
- Integrate this tool on JEM