CE11: Simplified context selection for significant_coeff_flag (JCTVC-C227)
(JCTVC-D195/m18948)
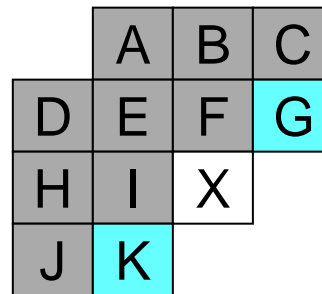
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HHI_TRANSFORM_CODING
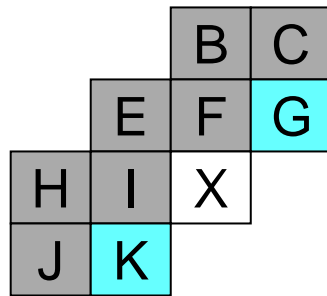
- In AVC, context of significant_coeff_flag depends on position

- HHI_TRANSFORM_CODING uses a highly adaptive context selection approach for significant_coeff_flag

- Context of significant_coeff_flag depends on up to **10 neighbors**.
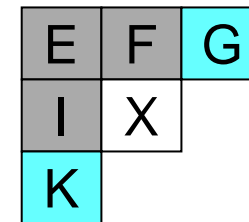
	A	B	C
D	E	F	G
H	I	X	
J	K		

Context for significant_coeff_flag in position X depends on surrounding positions highlighted in grey

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Simplified Context Selection

- Reduce dependencies on neighbors

- Reduce number of contexts

Reduce dependency from 10 →8
(Remove A, D)

Reduce dependency from 10 →4
(Remove A, D, B, C, H, J)
Reduce # context by 20

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Experiment Results

- TMuC-0.9 under common conditions

- Simulation platform is LSF equipped with Intel(R) Xeon(R) CPU X5570@2.93GHz 64 bits Linux machines

Coding Loss relative to TMuC-0.9 anchor

	Intra	Random Access	Low Delay
Reduction from 10→8 (Remove A, D)	0.0	0.0	0.0
Reduction from 10→4 (Remove A, D, B, C, H, J)	0.2	0.1	0.0

Negligible impact on % significant_coeff_flag bins: -1.76 % to 0.4%

Coding Gains of Simplified Context Selection vs. AVC

	Intra	Random Access	Low Delay
Simplified Context Selection (Dependency of 4)	1.5	1.3	2.7

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Experiment Results (Computation Time)

Encode Time (%)

	Intra	Random Access	Low Delay
Reduction from 10→8 (Remove A, D)	98	92	92
Reduction from 10→4 (Remove A, D, B, C, H, J)	95	93	91

Decode Time (%)

	Intra	Random Access	Low Delay
Reduction from 10→8 (Remove A, D)	98	97	101
Reduction from 10→4 (Remove A, D, B, C, H, J)	98	99	98

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Conclusions

- Reduce neighbor dependency by over half (10 $\rightarrow$ 4)

- Also reduce number of contexts by 15%

- Coding loss of simplified context selection over anchor 0 to 0.2%

- Coding gains of simplified context selection over AVC is 1.3 to 2.7%

- Recommend for adoption into HEVC test model

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