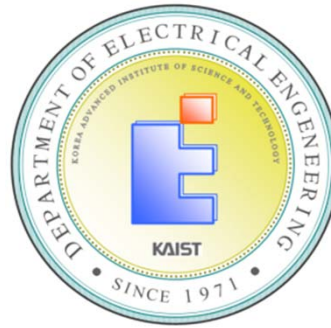


EFFICIENT SIGNALING OF TRANSFORM SKIPPING MODE

- JCTVC-H259, 8TH JCT-VC MEETING -



2012. 02. 05.

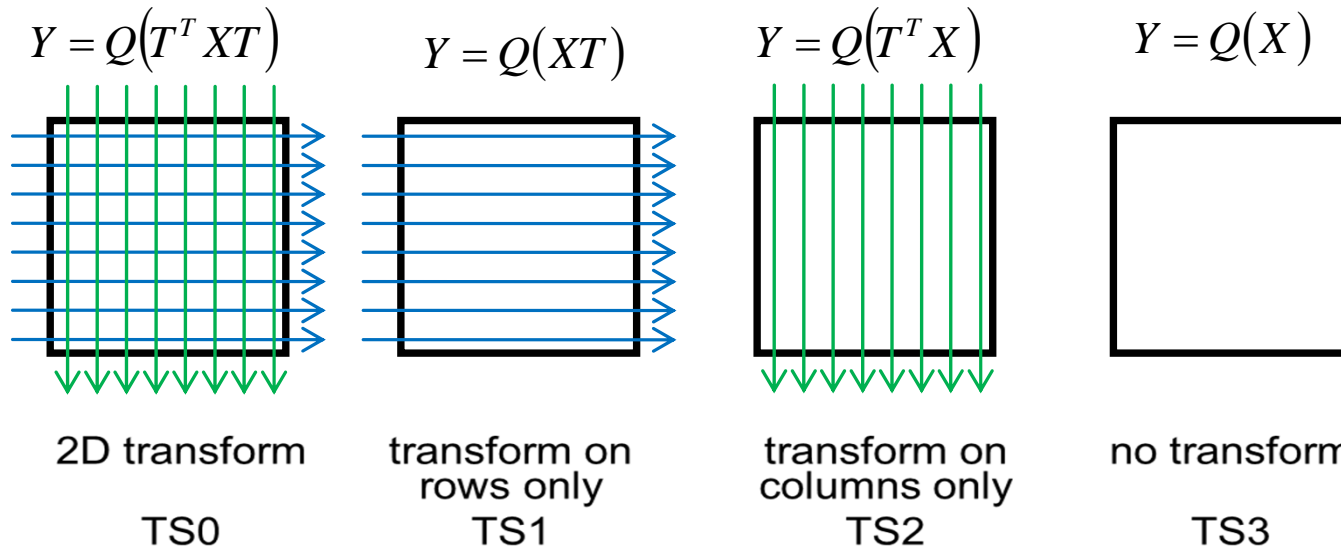
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KAIST

Summary

❖ Transform Skip Mode (TSM) for inter prediction

- TSM in SQT (square quadtree) and NSQT(non-square quadtree) supports four candidates such as 2D transform, row transform only, column transform only and no transform

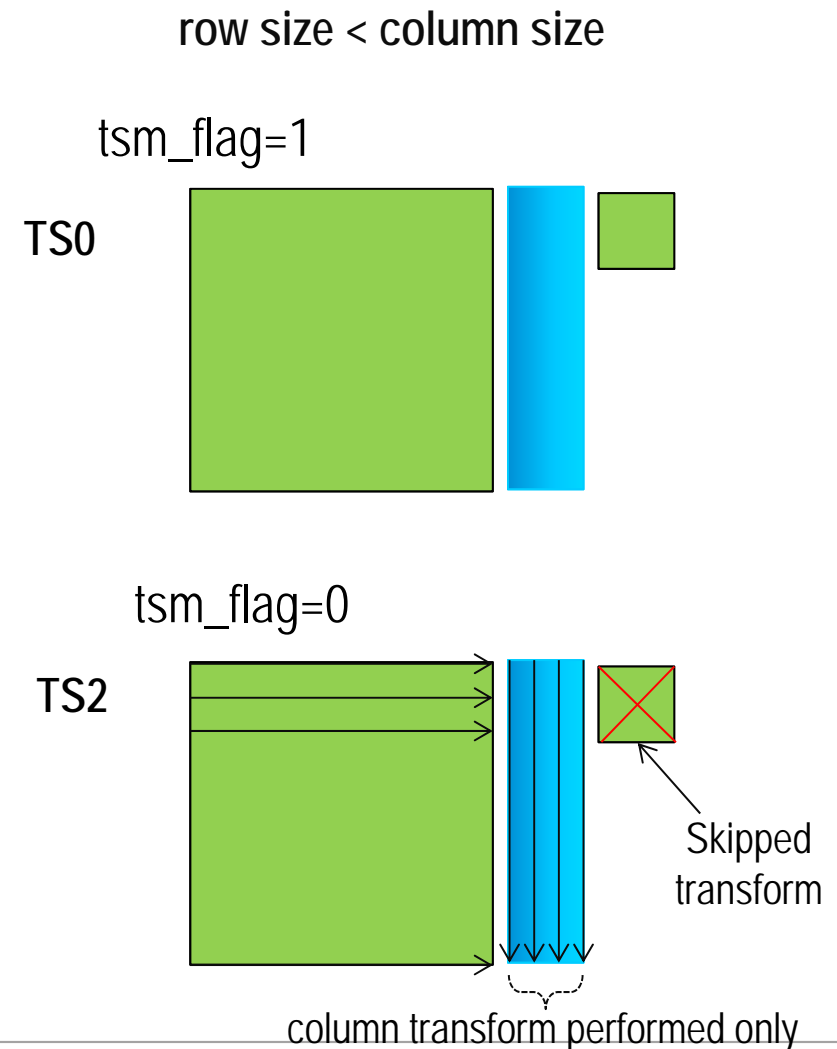
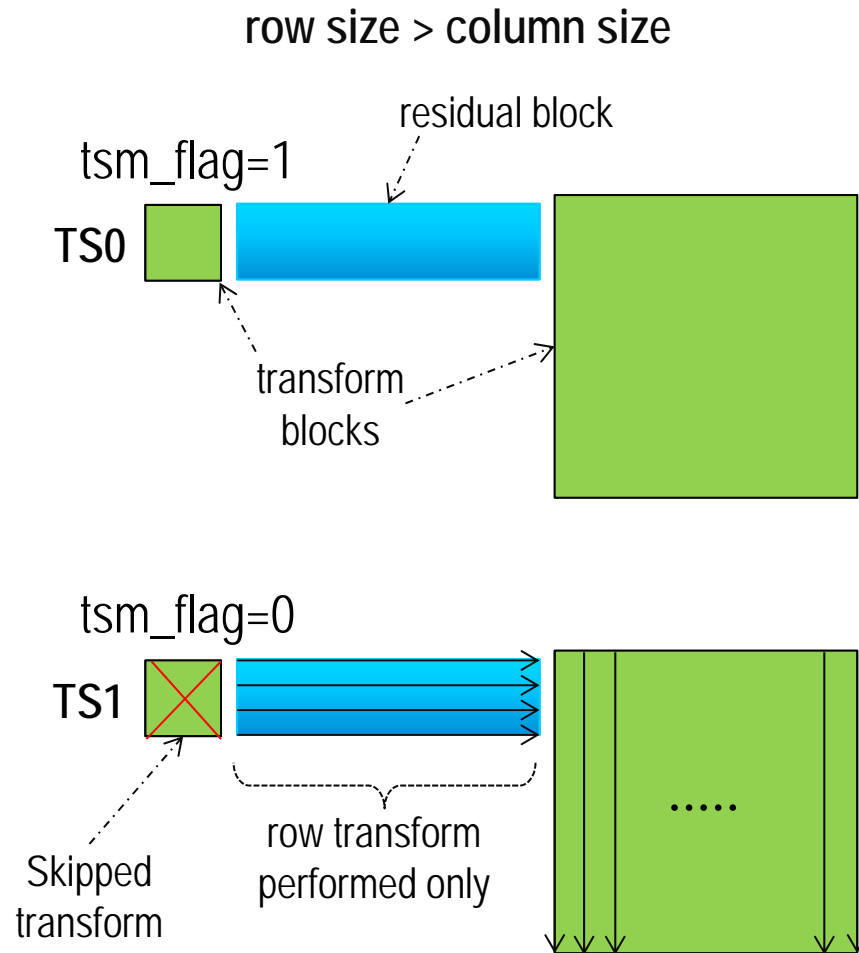


Summary

- ❖ The proposed simplified method for NSQT in TSM
 - The best selected TS mode for residual blocks is somewhat correlated with NSQT residual blocks types in NSQT.
 - Lower-order transform in TSM is more likely to be skipped than high-order transform for NSQT residual blocks.
 - This property can reduce the number of transform skipping modes in NSQT.
 - If the no-transform mode is excluded, a 1-bit flag can signal the transform skipping modes.
 - BD-rate performance is not degraded. Encoding time is reduced with 2~3%.

The proposed scheme

❖ Proposed transform skip modes for inter NSQT residual blocks



The proposed scheme

❖ Codewords in TSM

TSM		Code words
TS0	2D DCT	1
TS1	transform on rows	01
TS2	transform on columns	001
TS3	no transform	000

❖ Proposed new codewords for non-square transform block dependent transform skip

TSM		Code words		
		SQT	NSQT (row size > column size)	NSQT (row size < column size)
TS0	2D DCT	1	1	1
TS1	transform on rows	01	0	x
TS2	transform on columns	001	x	0
TS3	no transform	000	x	x

Experimental results

❖ Performance of proposed method against HM5.0

	RA HE			RA HE-10			LD B HE		
	Y	U	V	Y	U	V	Y	U	V
Class A	0.0%	-0.1%	-0.2%	0.1%	0.0%	-0.1%			
Class B	-0.2%	0.0%	0.2%	-0.2%	0.0%	0.1%	-0.3%	0.6%	0.5%
Class C	-0.5%	-0.3%	-0.1%				-0.7%	-0.4%	-0.2%
Class D	-0.8%	-0.1%	-0.1%				-1.2%	0.7%	0.8%
Class E							-0.3%	0.3%	0.0%
Overall	-0.4%	-0.1%	0.0%	-0.1%	0.0%	0.0%	-0.6%	0.3%	0.3%
	-0.4%	-0.1%	0.0%	-0.1%	0.0%	0.0%	-0.6%	0.3%	0.2%
Class F	-2.0%	-1.0%	-1.0%				-4.3%	-2.6%	-2.7%

Experimental results

❖ Performance of proposed method against HM5.0_tsm software

	RA HE			RA HE-10			LD B HE		
	Y	U	V	Y	U	V	Y	U	V
Class A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Class C	0.0%	-0.1%	-0.1%				0.0%	-0.2%	0.0%
Class D	0.0%	0.0%	0.2%				0.0%	0.3%	0.4%
Class E							-0.1%	-0.3%	-0.3%
Overall	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Class F	0.0%	0.0%	0.0%				0.2%	0.5%	0.5%
EncTime		98%			97%			98%	