

Intra mode parsing without access neighbouring information

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Introduction

- ❖ Intra mode parsing dependency on neighbor information
 - Luma intra directions
 - Need check 1MPM or 2MPM exist
 - Planar flag is coded after DC mode
 - Chroma intra directions
 - Context modeling for DM mode coding depends on neighbor intra mode
 - Total number of possible chroma intra modes is also depends on DM mode

- ❖ During parsing all above conditions should be checked and necessary information should be stored

- ❖ It is proposed to remove all checking and make independent parsing

Proposed framework

- ❖ Unification for Planar mode coding
 - Include Planar mode in the scope of angular modes
 - Assign index 3 for Planar mode right after DC

- ❖ Use only 2 most probable modes for every luma intra direction coding
 - Resolve situation when two MPM modes are same

- ❖ Remove context dependency for chroma DM mode coding
 - Use only one context instead of current 3

- ❖ Remove dependency on DM for total possible chroma intra modes
 - Always use DM, LM, Ver, Hor, DC and Planar modes
 - No chroma codewords removing

Unified Planar mode coding

- ❖ Planar mode was included into angular directions set
- ❖ Same angular mode coding method was applied for Planar mode

Mode index	Angular direction
0	Vertical
1	Horizontal
2	DC
3	Ver-8
4	Ver-4
...	
33	Hor+7

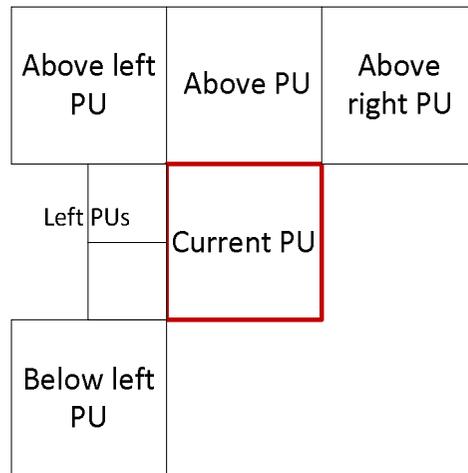
Planar

Mode index	Angular direction
0	Vertical
1	Horizontal
2	DC
3	Planar
4	Ver-8
5	Ver-4
...	
34	Hor+7

<i>Test configuration</i>	<i>Unified Planar coding</i>				
	Y	U	V	eTime	dTime
HE Intra	0.0	-0.2	-0.3	100%	100%
LC Intra	-0.1	-0.1	-0.1	100%	100%

Always 2 most probable modes

- ❖ Most probable modes are taken from left and above neighbour PUs
- ❖ Default mode is assigned if left and above intra modes are same



First MPM intra direction		Second MPM assignment	
0	Vertical	2	Planar
1	Horizontal	2	Planar
2	DC	3	Planar
3	Planar	2	DC
4..34	Angular modes	2	Planar

- ❖ Neighbour dependency was removed for chroma intra mode coding

<i>Test configuration</i>	<i>Always 2MPM</i>				
	Y	U	V	eTime	dTime
HE Intra	0.0	0.0	0.0	100%	100%
LC Intra	-0.1	0.1	0.1	100%	100%

Chroma coding modification

- ❖ Remove context dependency for chroma DM mode coding
 - Use only one context instead of current 3
- ❖ Remove dependency on DM for total possible chroma intra modes
 - Always use DM, LM, Ver, Hor, DC and Planar modes
 - No chroma codewords removing

intra_chroma pred mode	IntraPredMode[xB][yB]					Context index
	0	1	2	3	X (4 <= X < 35)	
0 (LM)	35	35	35	35	35	3
1 (Ver)	n/a	0	0	0	0	3
2 (Hor)	1	n/a	1	1	1	3
3 (DC/Planar)	2	2	2	2	2	3
4 (DM)	0	1	2	3	X	(leftChromaDir == DM) + (aboveChromaDir == DM)

intra_chroma_pred_m ode	IntraPredMode[xB]	Context index
	[yB]	
	X (0 <= X < 35)	
0 (LM)	35	1
1 (Ver)	0	1
2 (Hor)	1	1
3 (DC)	2	1
4 (Planar)	3	1
5 (DM)	X	0



Conclusions

- ❖ In this proposal, luma intra direction coding framework without access neighbouring information was proposed
 - Planar mode coding as one of the angular intra directions
 - Always two most probable modes are considered
 - Chroma intra mode coding
- ❖ Suggested framework provides less complexity for intra modes parsing and it is not necessary to check for neighbour intra directions at parsing stage.
- ❖ No loss are reported for both Intra HE and Intra LC configurations
- ❖ Based on the results, it is suggested to include proposed intra mode coding framework into HM.



Thank you !