Title : **VLC optimisation for block types**

1. Introduction

The use of a switchable filter to minimize the prediction error might give rise to a modification of the VLC for block attributes.

In table 1 the VLC for block type attributes of RM3 are given without taking into account the application of relative addressing of the fixed blocks, i.e. (see Doc. #181R) :

Y-MODES :		coded	MC	filt	Length
INTRA		–	–	–	4
NON-FILT FIXED		F	F	F	2
FILTERED FIXED		F	F	T	2
NON-FILT FIXED	MC	F	T	F	5
FILTERED FIXED	MC	F	T	T	5
NON-FILT INTER		T	F	F	4
FILTERED INTER		T	F	T	4
NON-FILT INTER	MC	T	T	F	3
FILTERED INTER	MC	T	T	T	3

UV-MODES :	coded	filt	Length
INTRA	–	–	2
NON-FILT FIXED	F	F	2
FILTERED FIXED	F	T	2
NON-FILT INTER	T	F	3
FILTERED INTER	T	T	3

table 1 :   VLC in Reference Model 3

2. Experiments

Table 2 contains the new statistics for the block attributes for the Split/Trevor, Checked Jacket and Miss America sequence.

Sequence :	Split/Trevor		Miss America		Checked Jacket	
Y-MODES :	%	Cwl")	%	Cwl	%	Cwl
INTRA	2.51	5	0.03	5	0.09	6
NON FILT FIXED	51.06	1	66.36	1	65.95	1
FILTERED FIXED	2.34	6	4.00	4	2.13	5
NON FILT FIXED MC	3.50	5	5.64	4	2.42	5
FILTERED FIXED MC	4.34	5	3.29	4	0.98	6
NON FILT INTER	8.83	3	8.57	3	19.05	2
FILTERED INTER	2.07	6	2.76	5	2.64	4
NON FILT INTER MC	12.81	3	5.79	4	4.44	4
FILTERED INTER MC	12.54	3	3.54	4	2.30	5
UV-MODES :						
INTRA	1.37	4	0.19	4	0.00	4
NON FILT FIXED	76.03	1	49.09	1	79.12	1
FILTERED FIXED	3.89	4	7.39	4	1.95	4
NON FILT INTER	12.20	2	23.89	2	16.95	2
FILTERED INTER	6.51	3	19.44	3	1.97	3

table 2 : Statistics for the block attributes
for Split/Trevor, Miss America and Checked Jacket

The column " % " indicates the percentage of appearence of a block attribute.
The column " Cwl " gives the code word length of the Huffman code

3. Conclusion

- The major difference with the adopted VLC for RM3 (see table 1) is the code word for the NON-FILTERED FIXED block attribute, which should have a length of one bit.

- The length of the other code words is strongly dependent on the used sequences.
The question is whether to use the VLC optimized for the most critical scene or to apply a sub-optimal VLC, based on an average over several sequences.

A possible compromis between the complexity of the VLC and a calculated average over the three sequences is depicted in table 3.

Y-MODES :	coded	MC	filt	Length
INTRA	–	–	–	5
NON-FILT FIXED (NON-MODIFIED)	F	F	F	1
FILTERED FIXED	F	F	T	5
NON-FILT FIXED MC	F	T	F	5
FILTERED FIXED MC	F	T	T	5
NON-FILT INTER	T	F	F	4
FILTERED INTER	T	F	T	4
NON-FILT INTER MC	T	T	F	3
FILTERED INTER MC	T	T	T	3

UV-MODES :	coded	filt	Length
INTRA	–	–	4
NON-FILT FIXED	F	F	1
FILTERED FIXED	F	T	4
NON-FILT INTER	T	F	2
FILTERED INTER	T	T	3

table 3 :   VLC proposal for block attributes

Note 1 :

The used relative addressing for the fixed blocks can now be adopted on the NON-MODIFIED blocks resulting in codewords from table 4 with omitting the first bit.

Table 5 contains the statistics for the classification indexes for
the Split/Trevor, Checked Jacket and Miss America sequence.

Sequence :	Split/Trevor		Miss America		Checked Jacket	
CLASS	#	%	#	%	#	%
zig-zag	19821	49.17	36916	71.71	10681	55.57
horizontal	8191	20.31	5942	11.54	4844	25.20
vertical	5422	13.45	4449	8.64	1628	8.47
second diagonal	6878	17.06	4170	8.10	2069	10.76

table 5 : Statistics for the classification indexes
for Split/Trevor, Miss America and Checked Jacket

According the table 5 the proposed VLC for the classification
indexes is shown in table 6.

CLASS	Length
zig-zag	1
horizontal	2
vertical	3
second diagonal	3

table 6 : VLC proposal for class indexes