

ISO/IEC JTC1/SC29/WG11
MPEG92/
September 1992

CCITT SGXV
Working Party XV/1
Experts Group for ATM Video Coding

Document AVC- 359
September 28, 1992

SOURCE : CNET - FRANCE TELECOM
TITLE : Simulation results of basic TM2

This paper presents the simulation results of our implemented TM2 encoder under the following simulation conditions :

- Frame structure pictures only
- 525 or 625 standards
- 4:2:0 format obtained by line dropping/repetition
- Prediction : Adaptive Frame/Field
- Sequences : Mobile&Calendar , Flower Garden , Fountain , Hockey ; 5 sec. each
- Bit rate : 4.0 Mbit/s
- GOP structure : M=2
 - N=12 (625 standard)
 - N=14 (525 standard)
- DCT : 8*8 adaptive Frame/Field
- Motion Estimation : 15.5 pel per frame distance ; Full search algorithm
- Rate control : TM2 step 3

A D1 tape demonstration of these results will be shown at the meeting.(Sequences from decoded bit streams)

Nombre d'images a traiter : 150
 Frequence des Intra : 14
 Frequence d'entree : 30
 Debit total (en kbit/s) : 4000
 Actual bit rate : 4.0537 Mbit/s

	A11	I	P	B
Number of pictures	149	11	64	74

RMS and SNR	A11	I	P	B
RMS on Luminance	4.33	3.69	3.94	4.71
RMS on Chrominance	2.65	2.24	2.54	2.80
SNR on Luminance	35.41	36.79	36.21	34.67
SNR on Chrominance	39.66	41.14	40.03	39.18

MEAN STEP SIZE	A11	I	P	B
Mean Step size	5.32	3.92	4.14	6.55
Mean Ref. Quantiser	7.90	6.36	6.63	9.22

MACROBLOCK TYPES	A11	I	P	B
FIX	370	0	862	0
INTER	83	0	192	0
INTER + MC	80	0	186	0
FIX + MC	2	0	4	0
INTRA	139	1320	76	17
BIDIR MIXT FIX	32	0	0	64
BIDIR MIXT COO	88	0	0	178
BIDIR BACK FIX	425	0	0	856
BIDIR BACK COO	24	0	0	48
BIDIR FORM FIX	53	0	0	106
BIDIR FORM COO	25	0	0	51

COEFFICIENTS	A11	I	P	B
Non zero transmitted Coeff.	9.72	10.13	10.51	8.02
Zero transmitted Coeff.	15.40	10.69	18.44	16.01

BIT ALLOCATION	A11	I	P	B
Picture headers	108	102	106	110
Slice headers	1140	1140	1140	1140
MBA	1101	1320	811	1320
MTYPE	3531	1779	1817	5274
MQMANT	1339	2296	1409	1137
Motion Vectors	6477	0	3515	10002
CBP	1561	0	2096	1331
Intra DC	4956	41982	3448	757
Y coefficients	93189	344646	106535	44268
C coefficients	16018	79389	17371	5427
EOB	3800	15840	3725	2075
Total per picture	133221	488494	141972	72842
Total per MB	101	370	108	55

DCT Type / MC Type	A11	I	P	B
Frame MC	648	0	130	1191
Field MC	575	0	1190	129
Frame DCT	1095	1279	1090	1071
Field DCT	225	41	230	249

Nombre d'images a traiter : 150
 Frequence des Intra : 14
 Frequence d'entree : 30
 Debit total (en kbit/s) : 4000
 Actual bit rate : 4.0332 Mbit/s

	A11	I	P	B
Number of pictures	149	11	64	74

RMS and SNR	A11	I	P	B
RMS on Luminance	3.91	2.99	3.69	4.20
RMS on Chrominance	1.57	1.24	1.57	1.81
SNR on Luminance	36.29	38.63	36.78	35.66
SNR on Chrominance	44.24	46.24	44.24	44.01

MEAN STEP SIZE	A11	I	P	B
Mean Step size	6.34	4.48	4.91	7.86
Mean Ref. Quantiser	9.57	7.44	8.03	11.22

MACROBLOCK TYPES	A11	I	P	B
FIX	23	0	54	0
INTER	45	0	59	0
INTER + MC	477	0	1110	0
FIX + MC	9	0	20	0
INTRA	136	1320	76	12
BIDIR MIXT FIX	173	0	0	349
BIDIR MIXT COO	277	0	0	558
BIDIR BACK FIX	49	0	0	98
BIDIR BACK COO	57	0	0	115
BIDIR FORM FIX	30	0	0	61
BIDIR FORM COO	63	0	0	127

COEFFICIENTS	A11	I	P	B
Non zero transmitted Coeff.	3.86	6.84	3.74	2.08
Zero transmitted Coeff.	9.68	12.07	10.48	5.98

BIT ALLOCATION	A11	I	P	B
Picture headers	108	102	106	110
Slice headers	1140	1140	1140	1140
MBA	1324	1320	1330	1320
MTYPE	3873	1793	3451	4547
MQMANT	2419	2367	2419	2233
Motion Vectors	31029	0	24931	40916
CBP	4015	0	5121	3655
Intra DC	4015	36860	2524	423
Y coefficients	73717	274606	103309	18262
C coefficients	2560	14182	2930	512
EOB	7024	15840	9739	3365
Total per picture	131128	348209	157000	76483
Total per MB	99	264	119	58

DCT Type / MC Type	A11	I	P	B
Frame MC	432	0	421	506
Field MC	790	0	899	814
Frame DCT	377	391	367	384
Field DCT	943	929	953	936

Nombre d'images a traiter : 125
 Frequence des Intra : 12
 Frequence d'entree : 25
 Debit total (en kbit/s) : 4000
 Actual bit rate : 4.0698 Mbit/s

	A11	I	P	B
Number of pictures	125	11	52	62

RMS and SNR	A11	I	P	B
RMS on Luminance	10.04	9.37	9.98	10.21
RMS on Chrominance	5.83	5.40	5.96	5.79
SNR on Luminance	28.70	28.15	27.95	27.95
SNR on Chrominance	32.82	33.48	32.62	32.88

MEAN STEP SIZE	A11	I	P	B
Mean Step size	12.70	9.80	9.90	15.56
Mean Ref. Quantiser	17.40	14.40	14.68	20.21

MACROBLOCK TYPES	A11	I	P	B
FIX	12	0	28	0
INTER	11	0	31	0
INTER + MC	543	0	1311	0
FIX + MC	75	0	180	0
INTRA	154	1584	34	2
BIDIR MIXT FIX	408	0	0	823
BIDIR MIXT COD	185	0	0	333
BIDIR BACK FIX	51	0	0	102
BIDIR BACK COD	23	0	0	50
BIDIR FORM FIX	103	0	0	207
BIDIR FORM COD	33	0	0	67

COEFFICIENTS	A11	I	P	B
Non zero transmitted Coeff.	6.60	11.00	5.37	3.64
Zero transmitted Coeff.	16.31	12.09	18.08	16.32

BIT ALLOCATION	A11	I	P	B
Picture headers	108	102	106	110
Slice headers	1368	1368	1368	1368
MBA	1590	1584	1599	1584
MTYPE	4872	2532	5586	4688
MQANT	3084	4740	4479	1621
Motion Vectors	12861	0	11786	16045
CBP	4182	0	7496	2145
Intra DC	6383	64761	1338	90
Y coefficients	104024	438058	135330	18503
C coefficients	14081	77166	16459	894
EOB	6486	19008	9543	1699
Total per picture	159039	609319	195290	48746
Total per MB	100	385	123	31

DCT Type / MC Type	A11	I	P	B
Frame MC	1003	0	1028	1160
Field MC	442	0	556	424
Frame DCT	815	942	845	767
Field DCT	769	642	739	817

Nombre d'images a traiter : 125
 Frequence des Intra : 12
 Frequence d'entree : 25
 Debit total (en kbit/s) : 4000
 Actual bit rate : 4.0643 Mbit/s

	A11	I	P	B
Number of pictures	125	11	52	62

RMS and SNR	A11	I	P	B
RMS on Luminance	8.90	8.11	8.73	9.17
RMS on Chrominance	6.41	6.01	6.46	6.44
SNR on Luminance	29.18	29.95	29.31	28.88
SNR on Chrominance	31.99	32.55	31.93	31.96

MEAN STEP SIZE	A11	I	P	B
Mean Step size	12.82	9.93	9.69	15.97
Mean Ref. Quantiser	16.29	13.53	13.63	19.00

MACROBLOCK TYPES	A11	I	P	B
FIX	40	0	95	0
INTER	16	0	38	0
INTER + MC	481	0	1155	0
FIX + MC	104	0	249	104
INTRA	164	1584	46	10
BIDIR MIXT FIX	425	0	0	856
BIDIR MIXT COD	151	0	0	305
BIDIR BACK FIX	72	0	0	144
BIDIR BACK COD	18	0	0	36
BIDIR FORM FIX	89	0	0	180
BIDIR FORM COD	26	0	0	53

COEFFICIENTS	A11	I	P	B
Non zero transmitted Coeff.	5.85	9.90	4.74	3.51
Zero transmitted Coeff.	15.24	12.71	17.13	11.39

BIT ALLOCATION	A11	I	P	B
Picture headers	108	102	106	110
Slice headers	1368	1368	1368	1368
MBA	1597	1584	1615	1584
MTYPE	5009	2531	5791	4792
MQANT	3214	4735	4641	1747
Motion Vectors	20581	0	17257	27022
CBP	3484	0	6129	1883
Intra DC	6306	58743	2154	486
Y coefficients	99513	422366	128096	18260
C coefficients	11056	45880	14785	1750
EOB	6745	19008	9969	1866
Total per picture	158981	556317	191911	60867
Total per MB	100	351	121	38

DCT Type / MC Type	A11	I	P	B
Frame MC	644	0	529	854
Field MC	801	0	1055	730
Frame DCT	658	585	678	655
Field DCT	926	999	906	929