

INTERNATIONAL ORGANISATION FOR STANDARDISATION
ORGANISATION INTERNATIONALE DE NORMALISATION
ISO/IEC JTC/SC29/WG11
CODING FOR MOVING PICTURES AND ASSOCIATED AUDIO INFORMATION

ISO/IEC JTC/SC29/WG11
MPEG93/
July 1993

Source : FRANCE TELECOM - CNET
Title : Simulation Results on AC-Prediction

INTRODUCTION

Leaky prediction has been proposed as a solution for cell loss concealment on ATM networks. We present hereafter some results to assess the coding efficiency, the visual quality and the cell loss resilience capability of this technique. Comparison is made with other concealment techniques.

SIMULATIONS

Leaky prediction

We have used the technique presented in core experiment F4 of TM5 on AC leaky prediction.

Cell loss

We used the TM5 cell loss model to generate errors in the packetized bitstream. But the UNIX random generator was used instead of the one described in the TM (which is extremely slow . Within the context of this simulation, results of both random generator can be considered as equivalent). The same parameters for the UNIX random generator were used in all the sequences.

Concealment

If a macroblock is lost, it is replaced with the co-located macroblock in the previous picture compensated with estimated motion vectors.

RESULTS

Simulations have been done on Mobile&Calendar and Flower Garden with the following parameters: Test Model 4 at 4 Mbit/s with $M=1$, adaptative Frame/Field MC and DCT, leaky factor (when used) of 0.9375, probability of cell loss (when loss) of 0.01 with a mean burst lenght of 2.

Coding efficiency

The following table summerised the results :

	Sequence Mobile&Calendar		Sequence Flower Garden	
	SNR Y	SNR C	SNR Y	SNR C
Standard N = inf	28.36 dB	31.33 dB	26.88 dB	31.69 dB
Leaky Ndc = 12	28.02 dB	31.26 dB	26.65 dB	31.63 dB
Leaky Ndc = 6	27.77 dB	31.17 dB	26.45 dB	31.55 dB
Standard N = 12	27.78 dB	31.21 dB	26.52 dB	31.76 dB
Standard N = 6	27.16 dB	31.00 dB	26.06 dB	31.60 dB

Visual quality

Without loss the leaky prediction makes the picture a little bit blurred compared with the standard without periodic intra picture but the quality remains quite good (in general better than the standard with periodic intra picture).

With cell loss, error resilience is good in both cases (intra or leaky). The refresh seams smoother with the leak.

CONCLUSION

Results obtained with the A-C leaky prediction method proposed in F5 are comparable with intra refresh for error concealment purpose. As leaky prediction does not outperform the concealment technique achievable with the existing MPEG2 tools, we think it is not necessary to add this extra feature in the syntax.