Telecommunication Standardisation Sector
Study Group 15
Experts Group for ATM Video Coding
(Rapporteur's Group on Part of Q.2/15)

Document AVC-532
July, 1993

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 : Cell Loss Resilience: Simulation results on concealment techniques

INTRODUCTION

Among the many solutions proposed to conceal cell loss in ATM networks, we have tested some of the ones which do not need important modifications of the syntax and can be realized with the existing MPEG2 tools.

SIMULATIONS

Cell loss

We have applied the cell loss model described in F1 using a UNIX random number generator. If a cell is lost, the decoder looses the current slice and does not resynchronize until the next slice header.

Concealment methods

We have tested three different methods :

1. Substitution of lost macroblock with the co-located macroblock of the previous frame.

2. Substitution of lost macroblock with the motion compensated macroblock of the previous frame if the frame type is P, and co-located macroblock if the frametype is I. The concealment motion vectors are obtained from the macroblock above the lost macroblock in the current frame.

3. Same as (2), but the motion vectors are estimated from the motion vectors field already decoded.

RESULTS

Simulations have been done on the sequence Mobile&Calendar and Flower Garden at 4 Mbit/s. We used M = 1, a probability of loss P = 0.01 and a mean lenght burst B = 2. Intra picture refresh was used.

The best results are obtained with (3):

. with (1), cell loss are very annoying, they produce some sharp cuts in the picture.

. with (2), some artefacts appear (for example, in Mobile&Calendar, the vertical motion of the calendar just above is used to compensate blocks of the train wich is moving horizontaly).

. method (3) is a little bit better than (2). Some artefacts still exist.

CONCLUSION

We think it is an efficient technique to conceal the lost macroblock with the motion compensated macroblock of the previous frame. Introducing this technique for I macroblock costs about 0.05 dB (conform to the results presented in [1]). It will avoid the cuts produced by cell loss in I macroblock and does not need some great changes in the syntax.

REFERENCE

[1] MPEG93/116 - AVC 405 : Experiments on increased error resilience by transmitting I-frame motion vectors. *David Sarnoff Research Center.*