CCITT
STUDY GROUP XV WP XV/1
Experts Group for ATM Video Coding
Torino January 21-22, 1993

Document # AVC-142

English Version

SOURCE: AT&T Bell Laboratories
PURPOSE: Informational

ISO
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO-IEC/JTC1/SC29/WG11

CODED REPRESENTATION OF PICTURE AND AUDIO INFORMATION

ISO-IEC/JTC1/SC29/WG11
MPEG 93/
January 1993

Source: AT&T

Title: Results of Experiments on Leaky Prediction

We have carried out numerous additional experiments on leaky prediction. The results confirm our earlier opinion that leaky prediction ought to be included in the MPEG2 core bitstream.

The advantages of leaky prediction include...

1. Leaky prediction adds a degree of fault tolerance that requires no special error detection or correction at the decoder. Moreover, the subjective effects of bit errors are less objectionable.
2. After a random access or channel change, a pleasing picture can often be seen more quickly with leaky prediction than with intra frames or slices.
3. In low delay applications that require small buffers, better picture quality can often be obtained than with intra frames.
4. Last but not least, the cost in syntax and implementation complexity is trivial.

We have found that adaptive control of the leak factor as well as adaptive quantization are helpful for pictures containing sizable areas of no motion. While at the lower bit-rates, eg, around 4Mbs, leak may exhibit noise in these areas for some pictures, at higher rates, eg, around 8 Mbs, no such problems have been seen.

We have found that the advantages of leak are more apparent, and the impairments much less visible with 60 hz, progressively scanned pictures, such as broadcast HDTV. Here the bit-rates are around 16 to 20 Mbs, the buffer sizes are potentially huge, and the transmission environment is much less controlled.

Studies of the tradeoffs between leak factor, quantization and error performance for a wide variety of pictures are extremely difficult with computer simulation. It is much easier to examine such effects with real time hardware. Thus, we hope to bring results of real-time processed HDTV , scaled down to D1.