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Document # AVC-350

English Version

SOURCE: A. Reibman: AT&T Bell Laboratories
TITLE: Leaky prediction: Experimental results
PURPOSE: Informational

1 Introduction

We present the results of some core experiments and experiments with cell loss for leaky prediction. Experiments are run using solution 2 to the limit cycle described in document AVC-349.

2 Equivalent quality with and without leak

We have coded 5 sequences with and without leak, and determined the leak factor necessary to obtain equivalent quality. The results are shown in Table 1. Without leak, Mobile and Flower were each coded with $N = 15$ and $M = 3$ (at 4 Mbps), and the equivalent leak factor (without I pictures) was found to be $\alpha = 7/8$. Without leak, Hockey and Bus were each coded with $N = 15$ and $M = 1$ (at 4 Mbps), and the equivalent leak factor (without I pictures) was found to be $\alpha = 15/16$. For a teleconferencing sequence, the leak factor needed to be $\alpha = 31/32$ to obtain equivalent quality (SIF at 1.15 Mbps) to the no-leak sequence with $N = 15$ and $M = 1$.

3 Cell losses

Next, we compare the effect of cell losses in sequences with and without leak. In each case, we compare sequences that have equivalent visual quality without any cell losses, as described above.

Initially, cell losses were generated according to Appendix F of TM2, with CLR=0.001 and a mean burst length of 2. However, because this produced losses in different images as well as in different locations in the same image, it was difficult to visually compare the resulting artifacts. While this is the preferred way to compare results when there is a statistically large sample of sequences, it is not effective in comparing two individual sequences.

Therefore, we generated cell losses for one sequence according to Appendix F, and recorded the macroblocks affected by the cell losses. The second sequence was then subjected to identical error in the equivalent macroblocks. Therefore, cell-loss artifacts appear in identical image locations and are visually comparable. We also repeated the experiment using the macroblocks affected by cell losses in the second sequence and obtained similar visual results.

A D1 tape demonstrates that cell losses are more visually objectionable in sequences without leak, since (i) the errors are visually stronger for a longer period of time, and (ii) when the errors disappear,

Sequence	No leak	With leak
Mobile	25.09	25.17
Flower	25.14	24.95
Bus	26.66	26.80
Hockey	32.78	33.41
Teleconf.	39.45	39.53

Table 1: SNR of sequences with cell losses

they disappear violently (with an intra-update) instead of gradually. Therefore, visual image quality is better with the leak, even if the SNR can somtimes be less.

Table 1 shows the SNR of the sequences with and without leak when affected by cell losses. The SNR is better with leak than without, except for Flowergarden.