

Telecommunication Standardization Sector
Study Group 15
Experts Group for ATM Video Coding
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Title : Experiments on leaky prediction
Purpose : Information

1.Introduction

Leaky prediction is proposed as a technique for temporal error localization. However Leaky prediction is also known as a coding which generates "noisy background". In order to fix the noisy background, some techniques are proposed. One is AC-Leaky prediction (Core experiments F.3) and the other is Adaptive DC quantization (MPEG93/80). This document describes the results of the comparison between these two methods.

2.Simulations

The computer simulations are carried out according to the condition shown in Table 1 and picture quality is assessed. In Adaptive DC quantization (ADQ), a special weighting matrix is applied for "background macroblocks" which are detected with " $N_{actj} \leq 0.6$ ".

Table 1 Simulation conditions

Common	base coding	TM3
	bitrate	4Mbps
	(N,M)	(150,1)
	prediction	frame/field adaptive
	structure	frame
	rate control	TM3 (step 3)
	sequence	Flower Garden 60 frames Mobile&Calendar 30 frames
AC-Leak Leak with ADQ	Leak factor	0.9375 (n=4)
	Ndc	6
	Background MB	$N_{actj} \leq 0.6$
	WN(0,0)	8 (16 in TM3)

3.Simulation results

Table 2 shows the simulation results.

Table 2 Simulation Results

method	SNR Y for P-picture (dB)	
	Flower Garden	Mobile&Calendar
TM3	28.26	25.90
Leak	28.48	25.83
AC-Leak	28.42	25.85
Leak with ADQ	28.23	25.64

AC-Leaky prediction and Leaky prediction with ADQ reduce the DC component of the noisy background. However, both methods could not reduce the AC components of the noisy background which is still visible in Flower sequence. In Mobile sequence, the both methods degrade the total picture quality.

4.Conclusion

At the bitrate of 4Mbps, AC-leaky prediction and Leaky prediction with ADQ could not achieve good picture quality because of noisy background. Higher bitrate would be desired for leaky prediction coding.