SOURCE : JAPAN
TITLE : Report of AC-Leaky Prediction
PURPOSE : Information

1. Introduction

AC-Leaky Prediction (F3) having technical feature below is experimented.

1) Remainder component (AC) of the 8x8-average value of prediction signal, is multiplied by a leak factor.

2) Average component (DC) of the signal is frequently refreshed.

According to its coding experiment, it has been learned that this methods renders a picture quality equivalent to a normal refreshment methods and an excellent characteristic against coding error.

2. Performance

Compared to the Picture(Slice)-Intra, the AC-Leaky Prediction has the following advantage.

1) Response to coding errors

The anti-error character of AC components is enhanced by leaky prediction.

Since a frequent inclusion of Intra Pictures of DC only, which allows an immediate restoration of DC component upon any errors, this prediction system is powerful against upon any errors.

2) Response to channel hopping

Starting from the DC picture which resides frequently, it returns to a normal picture quickly.

3. Experiment Results

As temporal Localization means, experiments are conducted on the normal refresh method (Picture-Intra and Slice-Intra), and AC-Leaky with DC-Refresh (DC-I), further on Picture-Intra (N = 15) added with DC-I. The result is shown in table 1.

Coding scheme : TM4-Frame-Picture, fr/fi-MC, fr/fi-DCT

Leaky factor   : 0.9375 (Ndc is a period of DC-Intra)

Sequence used : Flower Garden (60 frames)

Table 1. Y S/N in Frame-Picture (M = 1, 7 Mbps)

Refreshment	N=15 / Ndc=15	N=6 / Ndc=6	N=3 / Ndc=3
Picture-Intra	31.60 dB	30.89 dB	29.56 dB
AC-Leaky & DC-I	31.89 dB	31.74 dB	31.51 dB
Pic.-I(N=15) & DC-I	31.60 dB	-	31.24 dB

Frequent use of Picture-Intra causes a significant degradation of picture quality, thus it is difficult to use it often as means of Temporal Localization.

On the other hand, picture quality degradation is slight when the DC-I is added frequently to the AC-Leaky Prediction, i.e. the S / N is equivalent to that of Pic.-I (N = 15) in case of Ndc = 3.

4. Conclusion

The AC-Leaky Prediction which enables frequent refreshment of DC components, is a simple and effective method against any error for the reason that the AC components are refreshed by leaky prediction and the DC components are immediately restored.

END