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SOURCE : Japan
TITLE : Spatial-domain compensation for cell loss
PURPOSE : Information

1. Introduction

At the last meeting , we proposed that the standard cell-loss compensation scheme should provide both the spatial- and temporal-domain compensation mechanisms (AVC-332,MPEG92/472). In this document, two elements in the spatial-domain compensation, structured packing and concealment at the decoder, are individually evaluated through computer simulation.

2. Spatial-domain compensation

The proposed spatial-domain compensation scheme consists of two elements:

- Structured packing

  To minimize the degraded area in a picture affected by a cell loss.

- Concealment

  To minimize the picture distortion by interpolating the data of lost MB from the surrounding MBs.

The latter will be out of the standardization and the necessity of structured packing is focussed in this doccument.

3. Computer simulation

The effect of each element is evaluated through computer simulation using a TM2 based coding algorithm. The simulation conditions were as follows.

- Picture format : 4:2:0
- GOP structure : M=1, N=150 (IPPPP....)
- Picture structure : Frame picture
- Prediction method : Adaptive frame/field
- Mean cell-loss ratio : 10^{-3}
- Mean burst of cell loss : 2
- Overhead for structured packing : 20 bit/cell (Absolute MBA & pointer)

Table 1 shows the simulation results of each method. Either structured packing or concealment gives better quality than that of the case without any compensation. Furthermore, both elements works cooperatively and gives better SNR than the case when either element is applied. In subjective evaluation of the picture quality, the effectiveness of each element was obvious. Some of the reproduced pictures will be demonstrated by VCR at the meeting.

4. Conclusion

Two elements in the proposed spatial-domain compensation are individually evaluated through computer simulation. The results indicate that the both of the structured packing and concealment are necessary to realize sufficient cell-loss compensation.

Table 1: Average SNR(dB) in each scheme

	Structured packing	Concealment	Flower Garden		Mobile & Calendar	
			4 Mb/s	9 Mb/s	4 Mb/s	9 Mb/s
Without cell loss	–	–	28.60	33.36	26.69	31.07
	○	–	28.24	32.95	26.38	30.68
With cell loss	–	–	25.16	22.13	25.09	25.31
	○	–	26.78	27.44	25.74	28.59
	–	○	27.04	25.67	25.99	28.20
	○	○	27.71	30.50	26.14	29.72

○ : Item(s) applied