CCITT SGXV
Working Party XV/1
Experts Group for ATM Video Coding

Document AVC-187
December 26, 1991

Source : KDD
TITLE : Coding efficiency in low delay mode
PURPOSE : Information

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1. Introduction

Low delay mode of video coding which is indispensable in real time communication is compared with bi-direction coding scheme.

2. Computer simulation

Bi-direction coding is based on SM3 of MPEG1 combined with inter-field prediction. Each video field is coded and no down-conversion for compatibility with SIF or CIF is included. P-field is predicted by previous I-field or P-field, and B-field is predicted by 3 fields (Fig. 1).

On the other hand, in low delay mode field by field prediction is carried out. P-field directly after I-field is predicted by that I-field and each of other P-fields is predicted by 2 previous fields (Fig. 2).

In each mode bit assignment and component ratio of the different types of field was optimized. Simulation result is shown in Table 1.

3. Conclusion

In this simulation coding performance of low delay mode may not be sufficient comparing with bi-direction coding. Some improvement is necessary.

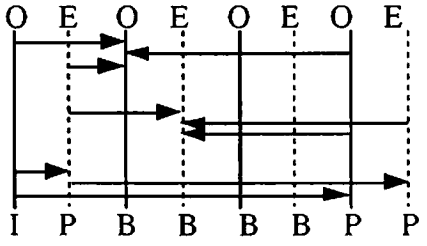

Fig. 1 Prediction in bi-direction coding

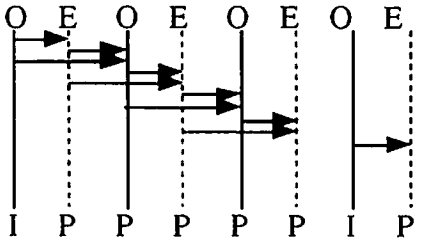

Fig. 2 Prediction in low delay mode

Table 1 Simulation result (Flower Garden - 60 fields, 9Mbit/s)

Coding mode	Bi-direction (N=30 M=3)	Low delay (N=15 M=1)
Bit assignment (I:P:B or I:P)	8:5:1	6:1
Y	34.33 dB	29.31 dB
Cr	36.16 dB	31.86 dB
Cb	36.19 dB	33.04 dB