CCITT SGXV
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SOURCE : Japan
TITLE : COMMENTS ON THE PICTURE FORMAT FOR ATM VIDEO CODING
PURPOSE : Proposal

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1 INTRODUCTION

It has already been agreed upon that H.32X terminals have to be able to communicate with H.320 terminals. Thus, interconnection between terminals located in the different TV standards regions is guaranteed at least with FCIF or QCIF. Higher quality communication of video signals that is required in ATM networks will be achieved in one of the following approaches.

(a) SCIF is defined both for inter/intra-regional communications
(b) SCIF is defined for inter-regional communication while local TV standard formats may be used for intra-regional communication.
(c) Local TV standard formats are used for encoding and a receiver is specified to be able to decode and display all received formats.

We have already mentioned in AVC-46 that SCIF approach (a) should be adopted as far as the following three conditions are satisfactorily met.

(1) Degradation of picture quality due to format conversion between local TV standards and SCIF is negligible
(2) Loss of coding efficiency is acceptable
(3) Delay caused by format conversion is sufficiently small

In addition, we are of the opinion that the following condition should also be taken into account:

(4) Hardware/software burden required for SCIF handling is acceptable

2 STUDY RESULTS

In order to verify the feasibility of approach (a), we have studied the

progressive type SCIF (720pelx576line, 59.94frame/sec; see AVC-29) proposed by several European countries. Our concern is how to achieve satisfactory coding of 525/60 interlaced pictures through SCIF. We summarize the results of our study obtained so far as follows.

(1) Degradation of picture quality

Observation of picture quality obtained in the simulation where R601(525/60) pictures are once converted to SCIF and then reconverted to R601(525/60) formats show that a line number conversion required in the 525 region can achieve acceptable picture quality (AVC-80 where 240 lines in a field are converted into 576 lines and picture quality of SCIF itself has not yet been verified). On the other hand, we have not yet found a frame rate conversion algorithm that gives sufficient picture quality. Further study should be made especially in the 625/50 region.

(2) Loss of coding efficiency

Coding SCIF pictures causes several ten % loss, compared with coding directly R601(525/60) pictures. It has also been found that practical conversion methods may require multi-frame prediction to reduce coding efficiency loss (AVC-79, AVC-242).

(3) Increase of delay

Increase of delay due to the format conversion between R601(525/60) and SCIF may be acceptable if it is performed only by intra-field filters, while the conversion between R601(625/50) to SCIF that requires inter-field filters may cause several ten msec delay when the number of filter taps is not small.

(4) Hardware/software burden

Assuming that the amount of hard/software is proportional to the pixel rate, SCIF pictures with a progressive format requires 2.4 times large hard/software compared with R601(525) pictures.

3 CONCLUSION

Considering these results obtained so far, we think that the progressive type SCIF with 720pelx576line and 59.94frame/sec is not promising. At this moment the interlaced format seems to be included in the candidates, but it requires further study to be defined as SCIF that satisfies the above requirements. If SCIF approach cannot give satisfactory solutions, another approach such as (c) in Section 1 should be investigated.

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