

SOURCE: RTT BELGIUM
TITLE: VBR VIDEO STATISTICS
PURPOSE: For Information

Introduction

During the last CCITT SGXV/1 Experts Group meeting for ATM video coding in Paris (May 23-31, 1991), a framework for further study regarding the variable bit rate video coding studies has been established and contributions were asked for. As an answer to this request, this contribution provides some measurement results of VBR coded video data. The paper is accompanied by a floppy disk, containing the measurement data.

VBR Video Codec

The basic coding scheme is differential pulse code modulation (DPCM) and three different coding modes are used :

1. intrafield prediction
2. interframe prediction
3. conditional replenishment

The selection of the coding mode is done per block of 8 by 16 pixels and is based on the interframe differences. For a detailed discussion on the implementation of the codec see [1].

Recorded Data

In the codec provisions were made to count the number of subpackets transmitted per frame. The data recorded on disk represents this number (N).

One subpacket contains 112 bits so the total amount of bits used to encode one frame equals : $112 * N$ bits. The bitrate can be calculated as : $N * 112 * 25$ bits/second.

Part of the measurements are discussed in [2].

The data were recorded on an IBM compatible PC running a program written in TURBO PASCAL. The data files were declared in TP as 'files of integer' and are in this format stored on diskette (2 bytes per integer).

For each measured video sequence, two files are recorded on disk:

- a .DAT file which contains the measured data (file of integer);
- a .RES file indicating the time and number of measurements (frames) recorded in the corresponding .DAT file (text file)

Four different types of typical VBR video services are investigated :

1. Videotelephony (VIPHONE on disk 1) Head and shoulder view of one person.
2. Videoconferencing (VICONF on disk 1) Head and shoulder view of two people in front of the camera.
3. Normal Quality Broadcast Video (disk 1) Different TV programs captured from the Belgian Cable Television network.
 - DIVERS : under water adventures
 - QUIZ :
 - ISAURA1 : TV series
 - FILM :
 - ISAURA2 : TV series

4. High Quality Broadcast Video (disk 2) Taken directly in the studios of the Belgian Radio and Television (BRT).

- FYSICS : educational program
- DUTCH : educational program
- BINGO : video clips
- NEWS :
- FILMDOC : film documentary
- FOOTBALL : football match
- OSHIN : TV series
- SPORT : sport events
- TVSERIES :

Conclusion

In this contribution, measurement data for VBR coded video were given for 4 different types of video service:
videotelephony, videoconferencing and normal/high quality broadcast.

References

- [1] W. Verbiest and L. Pinnoo, "A Variable Bit Rate Video Codec for Asynchronous Transfer Mode Networks", IEEE Journal Select. Areas in Commun., vol. 7, pp. 761-770, June 1989.
- [2] W. Verbiest, L. Pinnoo and B. Voeten, "The Impact of the ATM Concept on Video Coding", IEEE Journal on Select. Areas in Commun., vol. 6, pp. 1623-1632, December 1988.

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