Telecommunication Standardization Sector
Study Group 15
Experts Group for ATM Video Coding
(Rapporteur's Group on Part of Q.2/15)

Document AVC-573
July 1993

INTERNATIONAL ORGANISATION FOR STANDARDISATION
ORGANISATION INTERNATIONALE DE NORMALISATION
ISO-IEC/JTC1/SC29/WG11
CODED REPRESENTATION OF PICTURE AND AUDIO INFORMATION

ISO-IEC/JTC1/SC29/WG11/MPEG93/745

Source: M.E.Nilsson, D.G.Morrison, BT Labs
Title: The effect of up-sampling on two-layered coding
Purpose: Information

This contribution describes an investigation of the effect of the up-sampling process on the performance of a two-layered coder. Test Model up-sampling is compared with linear interpolation.

Experiments

The Calendar, Susie and Cheerleader sequences were used. For Calendar and Cheerleader, the lower layer was coded with MPEG-1 at 1.5 Mbit/s, and for Susie it was coded with H.261 at 512kbit/s. In all cases the upper layer was coded with an additional 2.5Mbit/s. Each sequence was coded twice with the following up-sampling processes.

1) Normal up-sampling was performed on the lower layer coded pictures, using a horizontal and vertical interpolator with taps -12 0 140 256 140 0 -12.

2) Up-sampling was performed on the lower layer coded pictures, using a horizontal and vertical interpolator with taps 128 256 128.

Results

There was no noticeable difference in subjective picture quality between the pairs of tests. The average SNR figures are given below. It can be seen that there is no significant change in SNR performance caused by using the different up-sampling processes.

	Y	U	V
Test 1	28.50	33.05	34.10
Test 2	28.47	33.05	34.12

Table 1. Average SNR figures for Calendar.

	Y	U	V
Test 1	41.93	46.09	46.37
Test 2	41.98	46.46	46.74

Table 2. Average SNR figures for Susie.

	Y	U	V
Test 1	29.22	31.06	32.09
Test 2	29.19	31.13	32.15

Table 3. Average SNR figures for Cheerleader.

Conclusion

The process of up-sampling lower layer coded pictures in a two-layer coder can be simplified to linear interpolation without any significant effect on the upper layer picture quality.

End of document