

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

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SOURCE : JAPAN
TITLE : Report of Non-8x8 DCT Experiment
PURPOSE : Information

1. Introduction

Non-8x8 DCT (Q5) method is experimented. It has been learned that 8x1 DCT is effective to the improvements on picture quality, which is evident on the Field-Picture in particular.

2. Experiments results

1) Comparison with 8x8 DCT only

The coding results are shown in Table 1 and 2.

a) Field-Picture

Condition : TM4 (M = 3) with fi / Dfi -MC, 4Mbps, Step 3 off

Table 1. Y S/N in Field-Picture

Sequences	8x8DCT-only	+ 8x1DCT
Mobile & Calendar	28.41 dB	+0.75 dB
Flower Garden	30.60 dB	+0.50 dB
Bicycle	29.13 dB	+0.47 dB
Bus	32.10 dB	+0.66 dB

a) Frame-Picture

Condition : TM4 (M = 3) with fi / fi-MC & DC, 4Mbps, Step 3 on

Table 2. Y S/N in Frame-Picture

Sequences	8x8DCT-only	+ 8x1DCT
Mobile & Calendar	27.99 dB	+0.22 dB
Flower Garden	29.62 dB	+0.30 dB
Bus	30.38 dB	+0.40 dB
Confetti	27.57 dB	+0.28 dB

On many of the test sequences, S / N improvement are recognized. and mosquito noise is significantly reduced in the subjective picture quality.

2) Comparison with Fr / Fi -DCT

Table 3 shows the results of the comparison between Fr / Fi -DCT in Frame Pictures. As can be seen the 8x8 / 8x1 -DCT with Fr-DCT only is superior the Fr / Fi -DCT with 8x8 -DCT only. Further, the S / N degradation of the 8x8 / 8x1 -DCT with Fr-DCT only is minimal compared to the 8x8 / 8x1 -DCT with Fr / Fi.

Condition : TM2 Frame-Picture (M = 3) with fi / fi-MC & DC, 4Mbps, Step 3 off

Table 3 Y S/N in Frame-Picture

Sequences	Fr / Fi on 8x8	8x8 / 8x1 on Fr	8x8/8x1 on Fr/Fi
Mobile & Calendar	29.06 dB	29.34 dB	29.36 dB
Football (old)	31.89 dB	31.78 dB	32.09 dB
Flower Garden	30.51 dB	30.78 dB	30.83 dB
Bicycle	28.29 dB	29.47 dB	29.60 dB

3. Conclusion

8x1 DCT is effective to the improvements on picture quality, which is evident on the Field-Picture in particular. In the frame Picture, Adaptation of 8x8 / 8x1 -DCT is more effective than adaptation of Fr / Fi -DCT.

8x1 DCT is desirable to be adopted since its burden to the implementation is light.

END